Virtual Weather Station

User's Manual

For Davis Instruments Vantage Pro, Vantage Pro, Vantage Pro2, Vantage Pro2 Plus, Weather Monitor II, Weather Wizard III, Perception, Oregon Scientific WMR-918 (cable free), Oregon Scientific WMR-968 (cable free), Huger WMR-968H (cable free), Oregon Scientific WM-918, Huger WM-918H, Radio Shack WX-200, Radio Shack 63-1016 Wireless, Peet Bros Ultimeter 100/800/2000/2100, Rainwise WS-2000 and WT-2000 Weather Stations, Texas Weather Instruments Weather Stations, Columbia Weather Systems Weather Stations, WeatherHawk, Kestrel 4000 PC Interface, LaCrosse WS 2300, LaCrosse WS 2310, LaCrosse 2315, La Crosse WS 3600, La Crosse WS 3610, ELV, Hyundai WS-05

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1 General Description

Virtual Weather Station is a software package that allows you to connect your personal computer to your weather station to display, plot and store data for comprehensive monitoring and analysis.

Virtual Weather Station brings your PC to life with a rich array of dynamic and colorful gauges, dials, graphs and charts. The desktop is completely customizable - you can arrange the virtual instruments based on your own personal preferences or application. You have literally over 1000 ways to display your data.

You do not even need a station to operate Virtual Weather Station. The data can be collected across a network, or downloaded from a METAR compatible weather station.

Virtual Weather Station runs on any Windows 32-bit operating system (95/98/NT/2000/ME/XP).

2 Virtual Weather Station Editions

There are three editions of Virtual Weather Station, based on features:

1. **Virtual Weather Station Base Version**. This version provides real-time display of the weather parameters.

2. **Virtual Weather Station Pro Edition**. This version adds detailed data analysis and reports.

3. **Virtual Weather Station Internet Edition**. This version provides all of the features in the Base and Pro Edition and adds Internet features.

This manual is separated into the three editions.

3 Weather Station Part Numbers

The software operates with Davis Instruments, Oregon Scientific, Huger, Rainwise and Radio Shack weather stations.

Table 1 - Station Part Numbers and Corresponding Reference in Virtual Weather Station provides a cross reference if your station's part number is different.

Manufacturer	Part Number	Virtual Weather Station Reference
Accuweather	63-1016	WMR-968
Davis Instruments	Vantage Pro	Vantage Pro
Davis Instruments	Vantage Pro Plus	Vantage Pro Plus
Davis Instruments	Vantage Pro2	Vantage Pro2
Davis Instruments	Vantage Pro2 Plus	Vantage Pro2 Plus
Davis Instruments	Weather Monitor II	WeatherLink
Davis Instruments	Weather Wizard III	WeatherLink
Hyundai WS-05	WS2310	WS2310
La Crosse Technology	WS2300	WS2300
La Crosse Technology	WS2310	WS2310
La Crosse Technology	WS2315	WS2315
La Crosse Technology	WS3600	WS3600
La Crosse Technology	WS3610	WS3610
Oregon Scientific	WM-918	WM-918
Oregon Scientific	WMR-918	WMR-918
Oregon Scientific	WMR-968	WMR-968
Huger	WMR-918H	WMR-918
Huger	WM-918H	WM-918
Nielsen Kellerman	Kestrel 4000	Kestrel 4000
Radio Shack	WX-200	WM-918
Rainwise	WS-2000	Rainwise
Rainwise	WT-2000	Rainwise
Peet Bros	100 / 800 / 2000	Peet Bros

Manufacturer	Part Number	Virtual Weather Station Reference
Texas Weather Instruments	1-Wire Weather Stations	Texas Weather Instruments
Columbia Weather Systems	Capricorn II, Capricorn 2000	Columbia Weather Systems
WeatherHawk	WeatherHawk	WeatherHawk

Table 1 - Station Part Numbers and Corresponding Reference in Virtual Weather Station

4 Hardware and Software Requirements and Display Preferences

4.1 Hardware and Software Requirements

The following hardware is required for communicating to the Weather Station:

- ✓ PC running Windows 95, 98, NT 4.0 (or greater), 2000, ME and XP with at least 10 MB of free disk space
- ✓ 8MB RAM
- ✓ Serial or USB Communication Port
- ✓ Serial or USB Cable. Serial to USB converters are available directly from Ambient Weather at:

  http://www.ambientweather.com/cousbto9sead.html

4.2 Display Preferences

Virtual Weather Station prefers high resolution or 16-bit color. Some images may result in poor quality at lower resolution settings.

- ✓ Virtual Weather Station is best viewed at 800 x 600 pixels or greater.
- ✓ Power or Energy saving features may result in distorted jpeg images and loss of communication to the Weather Station.

5 Getting Started

HINT: Menu Shortcuts are displayed in blue font.

5.1 Installing the Software

To install the software, run the following:

- ✓ setup.exe

If transferring the files to your hard drive, copy all of the files to a common directory and run **setup.exe** .

5.2 Connecting Your Communication Port to the Weather Station

5.2.1 Oregon Scientific, Radio Shack and Huger Weather Stations

Connect your weather station directly to your PC using a standard DB9M/DB9F serial or RS-232 cable (supplied by Ambient, LLC). The serial port on your computer is generally a 9-pin, male connector, similar to the 9-pin female RS-232 connector on your weather station.

5.2.2 Rainwise Weather Stations

Connect your weather station directly to your PC using the cable provided with your Rainwise Computer Interface.

5.2.3 Davis Instruments

Connection to the weather station requires the WeatherLink module.

5.3 Running Virtual Weather Station

Connect a serial cable to your computer's comport and verify your Weather Station is turned on.

Run Virtual Weather Station from the Virtual Weather Station icon.

5.4 License Information

Menu Shortcut: Help ▶ Registration Information

Enter the license information provided from online registration or the inside cover of the CD. The software includes a 30-day fully functional trial period.

Enter your name, company name (optional) and registration number provided. If the software is downloaded and ordered online, a registration file will be sent to you.

5.5 Upgrade to Pro or Internet Editions

To upgrade to Virtual Weather Station Pro or the Internet Editions, contact Ambient for upgrade costs. A registration number will be sent to you via Email. Enter this registration number by selecting the Upgrade button.

6 Virtual Weather Station Base Edition Features

6.1 The Assistant

Menu Shortcut: Help ▶ Assistant

If you are a new user, it is advisable that you completely run through the assistant to understand all of the features of Virtual Weather Station.

When launching Virtual Weather Station for the first time, the Assistant will automatically be displayed.

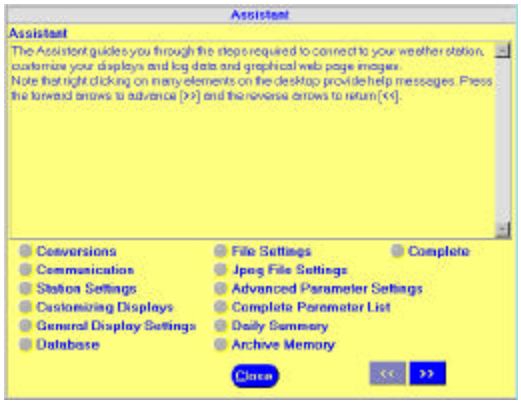

Assistant
Assistant
The Assistant guides you through the steps required to connect to your weather station, customize your displays and log data and graphical web page images.
Note that right clicking on many elements on the desktop provide help messages. Press the forward arrows to advance [>>] and the reverse arrows to return [<<].
Conversions
Communication
Station Settings
Customizing Displays
General Display Settings
Database
File Settings
Jpeg File Settings
Advanced Parameter Settings
Complete Parameter List
Daily Summary
Archive Memory
Complete
Close
<<
>>

Figure 1 - The Assistant

6.2 Conversions

Menu Shortcut: Settings ▶ Conversions

You may select the units of measure in which the data is displayed throughout the software. All program windows and files will display these units.

Figure 2 - Unit Conversion Settings

6.3 Calibration

Menu Shortcut: Settings ▶ Calibration

Virtual Weather Station allows you to calibrate for improved accuracy. In addition, if your wind speed sensor is below the expected reading due to bearing life, or the anemometer is obstructed by trees, these errors can be adjusted to provide realistic values.

The calibration takes the form of the following equation:

Calibrated Value = Gain x Measured Value + Offset

Reference *Table 2 - Examples of Calibration.* The table provides solutions for typical measurement problems. NOTE - changing the calibration settings in Virtual Weather Station will not adjust the parameters displayed from the console.

Note – setting the gain to 0 will cause the value to always read 0. Only set the gain to 0 if you do not have the sensor in your system.

Problem	Solution
The wind speed is reading 50% low because the sensor is obstructed by trees. In other words, when the wind speed reads 3 mph, it is actually 6 mph.	Set the wind speed gain to 2.00.
One of my temperature sensors is off by 3 degrees	Set the temperature offset to 3.00
I installed my anemometer incorrectly, and when it points north, it should measure south	Set the wind direction offset to 180.00

Table 2 - Examples of Calibration

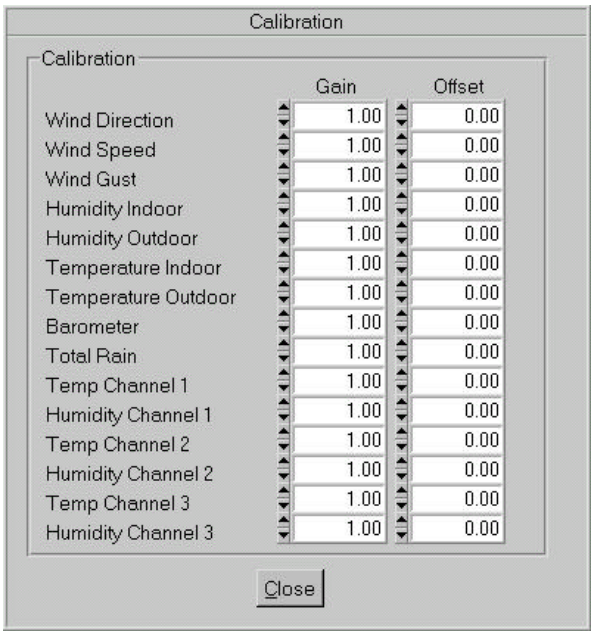


Figure 3 - Calibration

6.4 Precision

Menu Shortcut: Settings ▶ Precision

Precision is the number of decimal places. For example a precision of two would be represented as 3.14, and a precision of three would be represented as 3.141.

Virtual Weather Station allows you to customize the precision for each variable (unless otherwise noted on specific display panels). These precision values are represented in files, HTML tags and other various displays.

The precision can be changed for the values (which include averages) and rates of change. Changing the precision for the temperature will change all of the temperatures (example, indoor and outdoor).

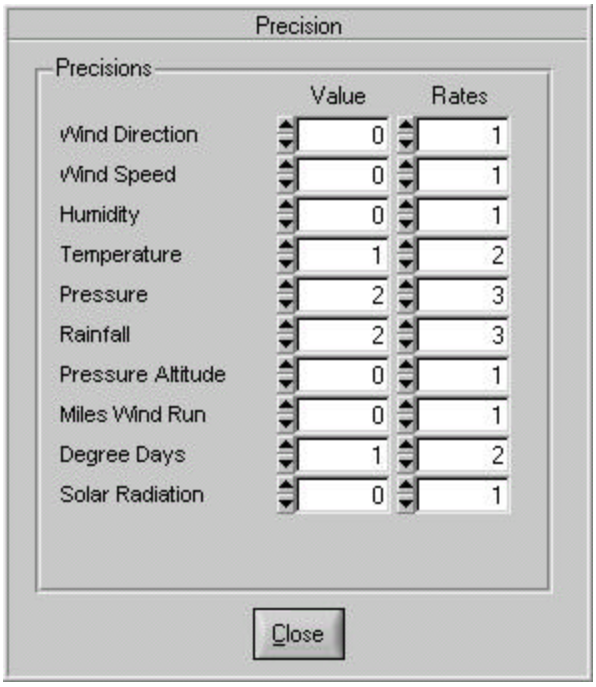


Figure 4 - Precision

6.5 Communication

Menu Shortcut: Communication ▶ Communication

6.5.1 Weather Station

Select your weather station from the list. If you do not own a weather station, select the Stationless mode of operation.

6.5.2 Communication Port

Select the communication port. Refer to the chapter on *Troubleshooting* Tips for more information on selecting the correct communication port if you are unsure.

6.5.3 Baud Rate

The baudrate is adjustable for the Davis and Rainwise stations.

6.5.4 Communication Rate

Specify the communication rate that VWS communicates to the weather station. If the computer performance is poor, try increasing this timer.

6.5.5 Complete Record Mode (Peet Bros Only)

Defines whether the data output is in the data logging mode or the complete record mode (Peet Bros Station only).

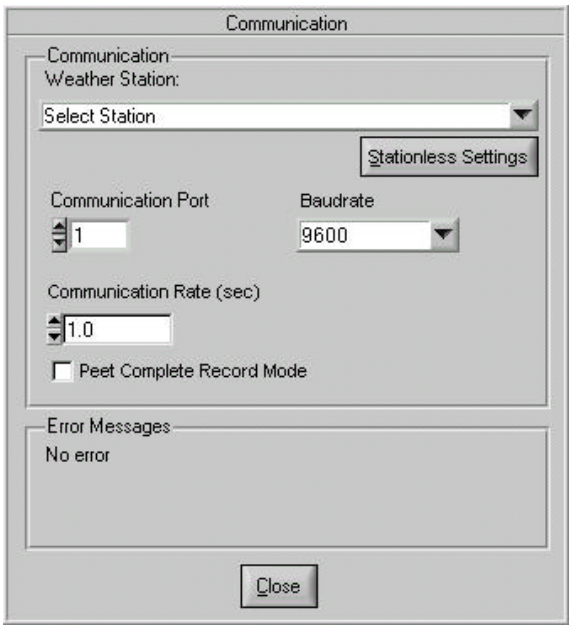


Figure 5 - Communication Settings

6.5.6 Sensor and Battery Status (WMR-918 and WMR-968 only)

Menu Shortcut: Communication ▶ Sensor Communication

6.5.6.1 Communication OK

After communication with the WMR-918 or WMR-968 weather station is detected, a green LED will be displayed. After all of the remote devices have reported, this window

will automatically close.

Virtual Weather Station will begin updating when all of the sensors have reported (can take up to one minute). Note that if a sensor is not reporting, it can be deactivated to continue running Virtual Weather Station.

6.5.6.2 Battery OK

A status LED will provide you with the status of the remote sensor batteries. If the LED is red, it is time to change the batteries. If the station is not reporting, the battery may be low or interference is present.

To allow Virtual Weather Station to execute without the sensor, inactivate the "problem" sensor by deselecting the Active checkbox.

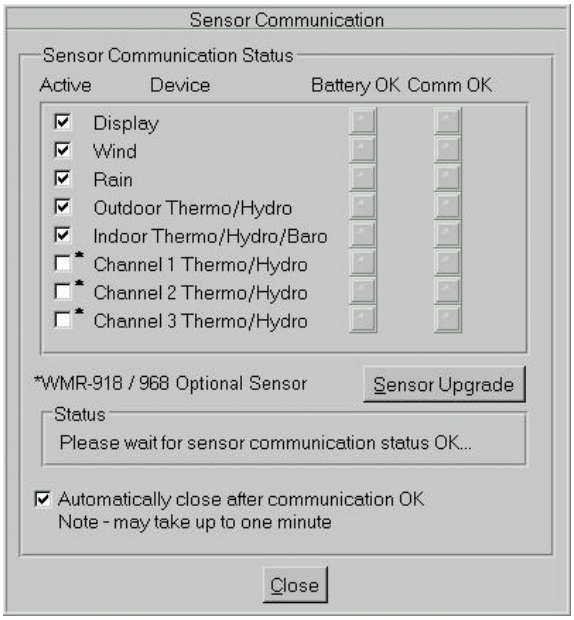


Figure 6 - Sensor Communication (WMR-918 and WMR-968 only)

6.5.7 1-Wire Stations

All 1-Wire Stations utilize PointSix's OneSix DDE Server. To download the OneSix server, please select the following link:

http://www.pointsix.com/support/software/OneSix32.exe

For more information, visit http://www.pointsix.com/cgi-bin/PointSix.cgi?Software

6.5.8 Stationless Operation

You do not even have to own a weather station to collect and display weather data, or you can view information from another computer collected on the network.

Reference Figure 7 – Stationless Mode Configuration. To operate in the Stationless mode, select the Stationless Weather Station option, and then the **Stationless Settings** button.

In the Stationless mode, the input is based on a comma separated file (csv) data generated by Virtual Weather Station running on a different computer across the network, from data downloaded from a METAR weather site, or data input from a third party program.

The format of the comma separated file data is described in Section 7.2.

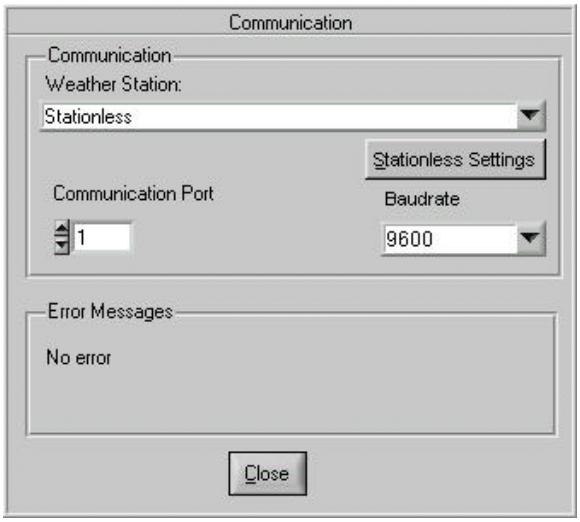


Figure 7 – Stationless Mode Configuration

6.5.8.1 Connecting to a Computer Across the Network

With Virtual Weather Station connected to your weather station on your local area network, you can launch Virtual Weather Station from any computer on the network and view this data real-time. The "host" computer (connected to the weather station) generates a comma separated file that is read by the "remote" computer. The following steps are required.

From the host computer, select the option to generate a comma separated file (reference Section 7.2).

Reference Figure 8 – Stationless Operation. From the remote computer, browse to the data.csv file generated by the host computer as described in Section 7.2.

From the remote computer, select the Run VWS Remote checkbox and browse to the location where VWS is installed on the host computer.

The program will automatically quit, and must be restarted.

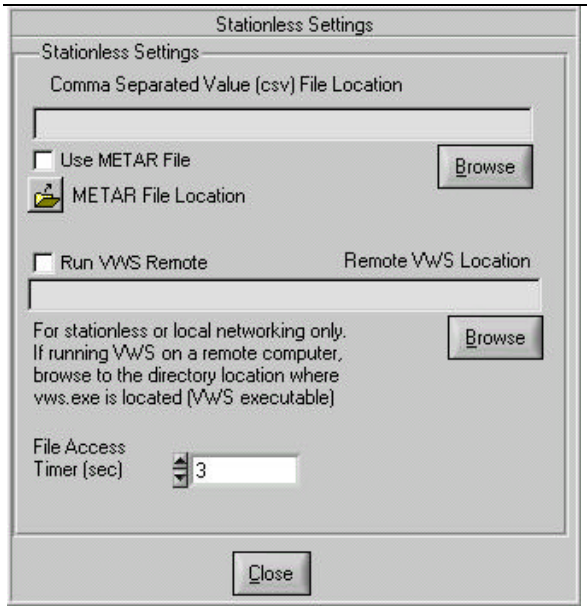


Figure 8 – Stationless Operation

6.5.8.2 Displaying METAR Data in the Stationless Mode

Virtual Weather Station can be configured to gather data from a METAR station, and display this data. VWS creates a csv file from the METAR data. To specify the METAR data, select the Use METAR file checkbox and select the METAR File Location button to browse to the csv file location.

6.5.8.3 File Timer Access

Set the file timer access to the rate at which the host computer updates the csv file. For example, METAR data updates may occur once per hour. Continuous file access, particularly across a network will degrade the performance of the remote computer.

6.6 General Program Settings

Menu Shortcut: Settings ▶ Program Settings

6.6.1 Start Program Hidden

The program can be set to start hidden when the computer starts. To view the hidden program, double click on the icon in the taskbar.

6.6.2 Reboot Schedule

For remote monitoring applications, it is sometimes advantageous to automatically reboot periodically to keep the program resources fresh.

6.6.3 Hide Toolbar

Select this option to hide the toolbar and status bar. This will increase the display viewing area.

6.6.4 Quit Program Prompt

Prompts the user prior to terminating the program.

6.6.5 CPU Resources

You can adjust the CPU resources VWS uses to run. The high setting will increase the performance of VWS but may decrease the performance of other programs. The low setting will decrease the performance of VWS but increase the performance of other programs.

If VWS "locks up", this may be due to a lack of resources. Try increasing the CPU resources.

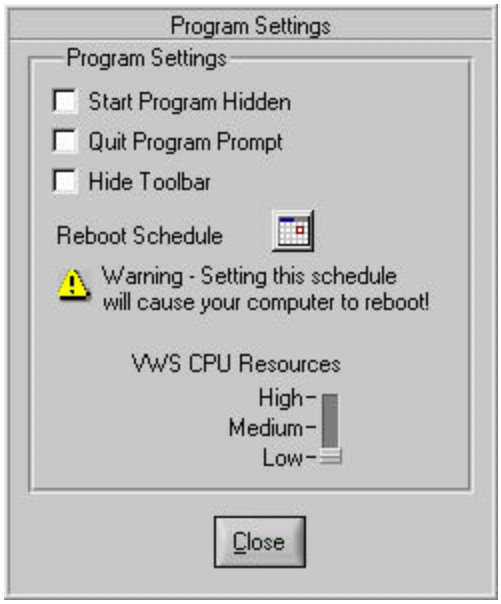


Figure 9 – General Program Settings

6.7 Station Settings

Menu Shortcut: Settings ▶ Station Settings, Sun, Moon and Altitude

Station settings are required to calculate your sunrise, sunset, moonrise and moonset, and the barometric pressure corrected to sea-level.

6.7.1 Station Description

Used for automated webpage insertion, the station description can be inserted into any webpage using the following tag:

^wsdescription^

For more information regarding tags, please reference Section 8.13.1.

6.7.2 Station Location

Used for automated webpage insertion, the station location can be inserted into any webpage using the following tag:

^wslocation^

For more information regarding tags, please reference Section 8.13.1.

6.7.3 World Location

Used for automated webpage insertion, the world location can be inserted into any webpage using the following tag:

^world_id^

For more information regarding tags, please reference Section 8.13.1.

6.7.4 Longitude and Latitude

To calculate the sunrise, sunset, moonrise and moonset for your location, the longitude, latitude, and time zone is required. If the sunrise and sunset appear incorrect, see *Troubleshooting* Tips.

There are several sources for determining the longitude and latitude for your location. The best source is the Internet. Another source may be your local town hall.

GeoCode.com provides this information at the following link:

http://www.geocode.com/modules.php?name=TestDrive_Eagle

or browse to www.GeoCode.com and select the link "Test Drive".

Note – if you live in the Southern Hemisphere, enter a negative sign in front of the latitude. If you live in the Western Hemisphere (America, etc), enter a negative sign in front of the longitude.

Example for Seattle, WA:

Longitude = -112.3168

Latitude = 47.0652

6.7.5 Time Zone

The time zone is required for calculating the sunrise, sunset, moonrise and moonset. If you live in a time zone that does not adhere to the GMT standard and is offset by 30 minutes, enter the offset in the +Time Zone Offset (min) numerical field.

If the daylight savings time is not calculated properly by your Windows operating system, you can compensate by adding or subtracting 60 minutes.

The celestial calculator is a close approximation of the sunrise and sunset in your location and may be inaccurate by several minutes due to equation inaccuracy or your altitude (the equations are based on sea-level).

6.7.6 Altitude

An air data calculator is included in Virtual Weather Station. Virtual Weather Station uses the same formulas used in airplane data computers flying throughout the world. The altitude and air data information provides air density, pressure altitude, corrected temperature and pressure to sea-level conditions.

6.7.7 Air Data Calculator (correcting Pressure to Sea-level Conditions)

To compare pressure conditions from one location to another, meteorologists correct pressure to sea-level conditions. Because the air pressure decreases as you rise in altitude, the sea-level corrected pressure (the pressure your location would be at if located at sea-level) is generally higher than your measured pressure. Thus, your pressure may read 28.62 inHg (969 mb) at an altitude of 1000 feet (305 m), but the corrected pressure is 30.00 inHg (1016 mb).

The standard sea-level pressure is 29.92 in Hg (1013 mb). Pressure conditions greater than 29.92 inHg (1013 mb) are considered high pressure and less than are considered low pressure.

Most weather stations instruct you to find a reporting station near your location to identify the corrected pressure, but Virtual Weather Station calculates this offset for you.

To calculate this offset:

- ✓ Enter your altitude
- ✓ Virtual Weather Station displays your bias with respect to sea-level.
- ✓ Enter this bias in your weather station (see the weather station instruction manual for details).

Sea-level temperature is important to racing enthusiasts and engineers for calculating performance characteristics.

6.7.8 Station Settings, Sun, Moon and Altitude

Corrections

Virtual Weather Station includes a celestial calendar for calculating sunrise, sunset, moonrise and moonset times. You can calculate these times for any calendar date.

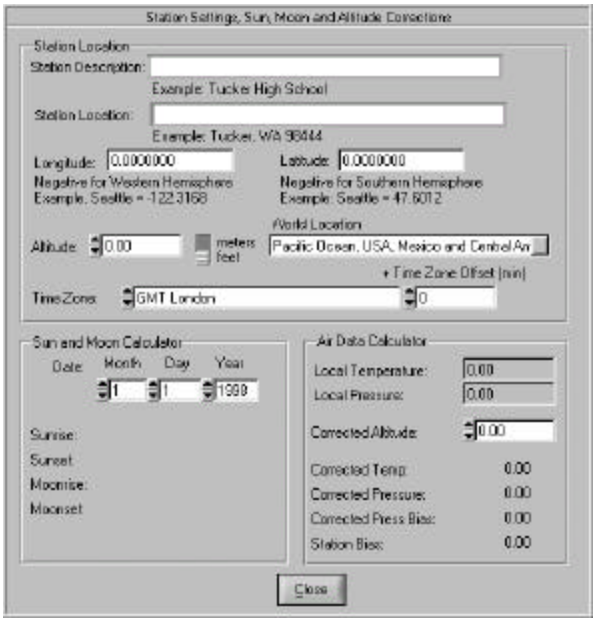


Figure 10 - Station Settings (Location and Altitude)

6.8 Multiple Station Settings

Menu Shortcut: Settings ▶ Multiple Station Settings

Virtual Weather Station supports multiple station configurations. Thus, the data and desktop settings can be different for each weather station in a network of weather stations.

To create a new station settings, select Create New Station. To recall a station setting, select Recall Existing Station. The data for each station is stored in a file based on the station name, as displayed in the Station Directory Pathname. To select this file, double-click on the filename.

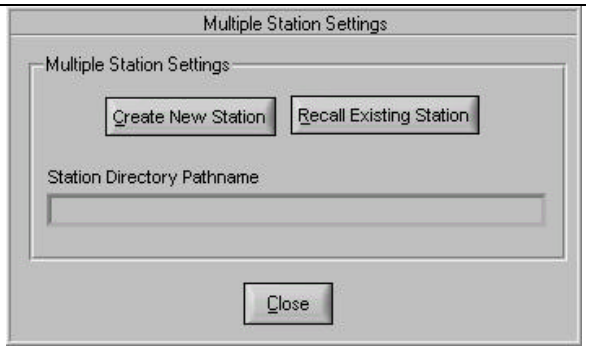


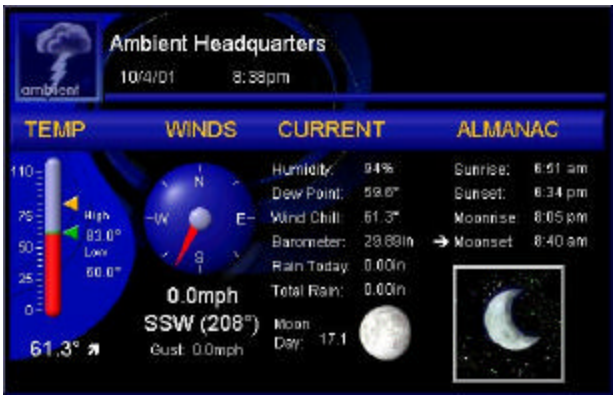
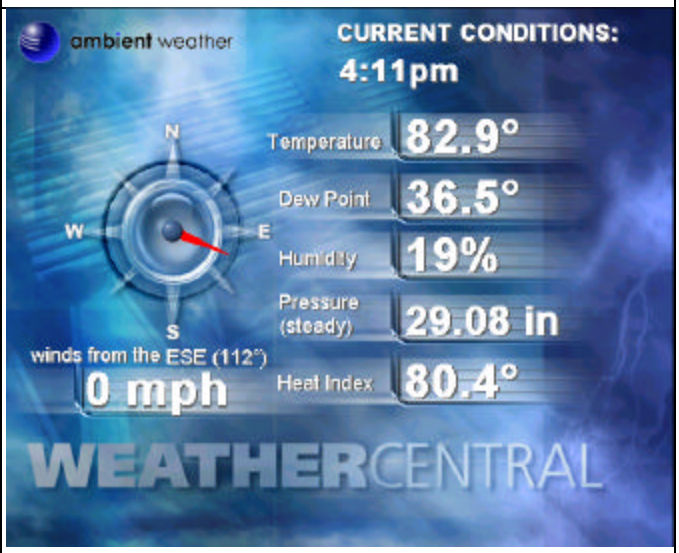
Figure 11 –Multiple Station Settings

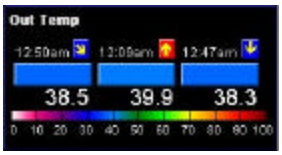
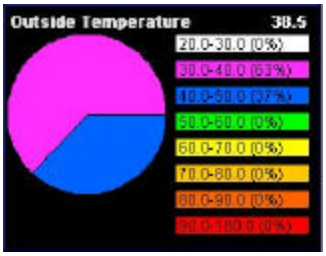
6.9 Real-time Data

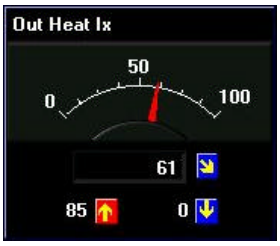
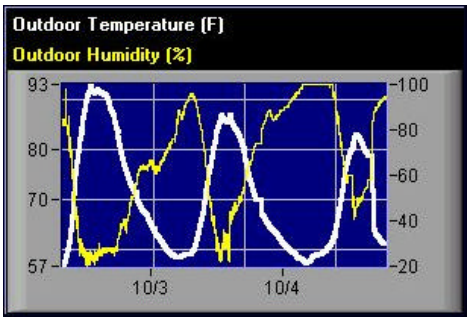
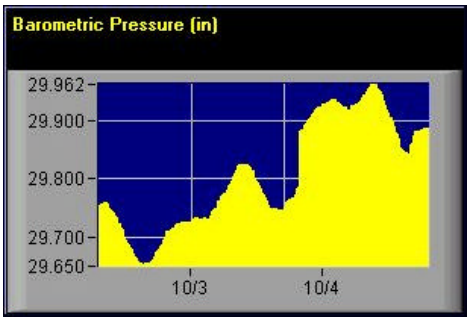
Virtual Weather Station continuously collects data from your weather station. The sample rate varies based on your weather station's specifications. See your weather station user manual for specifics on the sample rate.

6.10 Weather Displays

Table 3 provides a list of the weather displays and a description of each display.

Description	Display
6.10.1 Icon Weather conditions based on weather station prediction. Switches from day to night based on sunrise and sunset times.	
6.10.2 Broadcast TV broadcast display. Logo and location name can be modified by selecting right-mouse click on display.	
6.10.3 Cable TV Slide Designed exclusively for WeatherCentral Cable TV applications. Allows user to incorporate into cable TV slide show.	

Description	Display
6.10.4 Cable TV Slide 2 Designed exclusively for WeatherCentral Cable TV applications. Allows user to incorporate into cable TV slide show.	
6.10.5 Color Spectrum Color bars change color based on adjustable color spectrum. Displays daily high, low and current value. Rate of change arrow represents rising, falling or steady.	
6.10.6 High / Low Display Simple daily high and low display. Displays daily high, low and current value. Rate of change arrow represents rising, falling or steady.	
6.10.7 Distribution Chart Pie chart displays historical distribution. Range values are adjustable. Note - the chart will be empty if (1) the database is empty (example, when the program is first started, or (2) Data has not been collected in the plot time frame specified in the attributes window (the program was off).	
6.10.8 Wind Direction Displays current wind direction. Display fills clockwise from the North.	

Description	Display
6.10.9 Thermometer Thermometer gauge with rate of change arrow and high / low pointers.	
6.10.10 Gauge Rotary gauge with rate of change arrow. If the maximum limit of the gauge is exceeded, the gauge displays a red alarm box.	
6.10.11 Meter Meter gauge with rate of change arrow. If the maximum limit of the gauge is exceeded, the gauge displays a red alarm box.	
6.10.12 Graph, Graph2 Plot one or two parameters vs. time. Data is based on database, and can be plotted over several hours or days. Provides an array of graphical styles and options, such as line style and auto scaling. Note - the graph will be empty if (1) the database is empty (example, when the program is first started, or (2) Data has not been collected in the plot time frame specified in the attributes window (the program was off)..	 

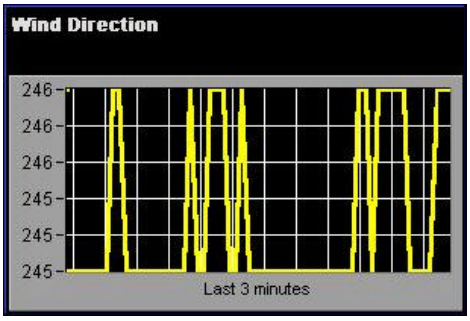
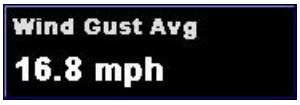
Description	Display
6.10.13 Strip Chart Provides rapid real-time data (data is not stored). Intended for viewing data over minutes to view rapid trends (example, wind speed and wind direction). The strip chart does not store historical data, and will start over each time the program is launched.	
6.10.14 Tank Colorful display fills based on color spectrum. Includes high and low pointers and rate of change arrow.	
6.10.15 Alpha Numeric Simple alphanumeric display.	 
6.10.16 Moon Phase Current Moon phase or moon day.	

Table 3 - Weather Displays

6.10.17 Difference Between Graphs and Strip Charts

The graphs and strip charts serve two very different purposes. Table 4 - Graphs vs. Strip Charts outlines the differences:

Feature	Graph	Strip Chart
Plot long term trends, such as temperature, pressure and humidity over several days and weeks.	✓	
Plot short term plots, such as wind speed and direction, over minutes or hours		✓
Uses stored data (database) for plotting	✓	
Loses data after program is restarted		✓

Table 4 - Graphs vs. Strip Charts

6.11 Customizing Displays

6.11.1 Adding and Deleting Displays

Menu Shortcut: Modify Display▶ Icon, Broadcast, Cable TV Slide 1, Cable TV Slide 2, Color Spectrum, High / Low Display, Wind Direction, Distribution, Thermometer, Gauge, Meter, Graph, Strip Chart, Ribbon, Alpha Numeric, Moon Phase

The desktop can be completely customized, including size and location of the displays. You can choose hundreds of different display combinations.

Select the display type and parameter from the menu bar, and the display will be added to (or deleted from) the desktop.

Right-mouse-click on the display to modify the individual display attributes.

Note that some of the check boxes will be dimmed depending on the display. For example, the Forecast can not be displayed from the graphs or strip charts because it is not saved in the database. All parameters can be viewed using the alphanumeric display.

NOTE - Sensor options vary from station to station. Check your Weather Station user's manual for the complete list of weather parameters.

Figure 12 - Add / Delete Displays with Parameter List

6.11.2 Modifying the Display and Display Attributes

{Right-mouse-click on any weather display}

To modify any of the displays, right-mouse-click on the display. The following display attributes are adjustable:

Attribute	Description
Display Title	Display Title can be modified for each display
Display Title 2	Only valid for graphs and strip charts. Displays second graph title.
Title Color	Changes the title color.
Title Color 2	Only valid for graphs and strip charts. Changes the title 2 color.
Lower Limit	Lower display numerical limit.
Upper Limit	Upper display numerical limit.
Precision	Numbers left of the decimal point. For example, a precision of zero is 76, a precision of 2 is 76.03.
Background Color	The display background color.
Number Color	The number color for all of the numbers in the display
Frame Color	Weather display frame color
Needle Color	Needle color for meter and rotary gauge
Fill Color	Fill color for gages and graphs
Frame Width	The width of the frame
Scale %	Adjusts weather display size. Requires Scale Contents on Resize checkbox selected.
Scale Contents on Resize	Scales the contents of the display when resized manually by clicking and dragging the display image, or selecting a scale percentage.
Autoscale Plot	Auto scale y-axis on graphs and charts
Plot Previous x hours (or minutes)	Plots previous number of hours for graphs and minutes for strip charts,. If unchecked, graphs all of the data in your database.
Plot Style	Customize different plotting styles for graphs and strip charts (thin line, fat line, vertical fill, step)

Attribute	Description
Add second plot	Adds a second plot to the graph or strip chart.
Plot Color	Specify plot color for both plots
Grid Color	Specify grid color
Jpeg Filename	Each graphical element has a specific jpeg filename when this option is activated. Provides a reference for each specific jpeg filename. For more information on jpeg files, *reference Section 8.8.*
X and Y Gridlines	Change the number of gridlines displayed on graphs and strip charts.

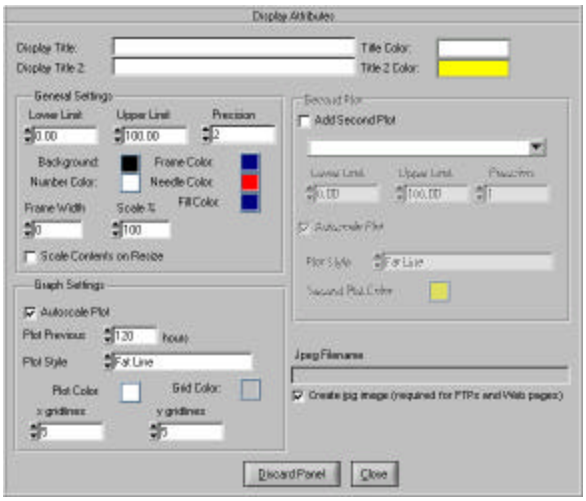


Figure 13 - Display Attributes

6.11.3 Broadcast Display Settings

Menu Shortcut: Modify Display▶ Broadcast Display

The broadcast display can be customized with your own logo image and title. To view the broadcast display settings, right-mouse-click on the broadcast panel.

6.11.3.1 Displaying the Icon

The icon can be displayed on the Broadcast display. To specify the method for updating the icon, select the Icon Settings Button.

6.11.3.2 Changing the Background Image

A custom image can be displayed in the broadcast display.

6.11.3.3 Changing the Logo Image

The default logo image is for Ambient. This can be customized to include your own personal logo.

6.11.3.4 Web Cams, Weather Cams and Dynamic Images

WebCams or WeatherCams can be displayed in the broadcast panel. To display a WeatherCam image, a software package such as ImageSalsa is required to generate jpeg images. The images are then imported into Virtual Weather Station by defining the path to where the files are located. The images can be viewed as a still frame or a time lapse, providing a summary of weather over the course of the day.

For more information on ImageSalsa, please visit the following:

http://www.ambientweather.com/ExtDesc.asp?id=874

6.11.3.4.1 Displaying the WeatherCam Image in the Broadcast Panel

To display the WeatherCam image in the Broadcast panel, launch WeatherCam32 or ISpy and begin automatically generating the jpg image. Once this image is created and automatically updated, browse to the location on your hard drive by selecting the Browse button in the Broadcast Panel.

6.11.3.4.2 Sizing the Image

The image can be sized to fit inside the control, or the control can be resized to fit the image size. Select the Size Control to Image pull down menu.

6.11.3.4.3 Image Time Stamp

To display the last update time of the WeatherCam image, select the Image Time Stamp checkbox.

6.11.3.4.4 Daytime Update Only

Since nighttime WeatherCam images can be uneventful, select this checkbox to stop updating the WeatherCam image at night.

6.11.3.4.5 Time Lapse

A time lapse of the WeatherCam image can be displayed. Select the Time Lapse checkbox, the lapse rate and the number of images in the time lapse. Note that the time lapse feature can only be viewed on the computer and not over the Internet.

6.11.3.4.6 Reset Display at Midnight

Memory leaks may occur with some operating systems when updating images. To reset memory at midnight, select the checkbox and the panel will be discarded and reloaded.

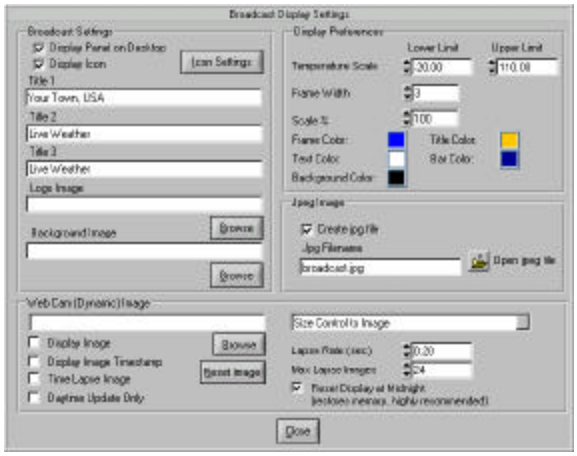


Figure 14 - Broadcast Display Attributes

6.12 General Display Settings

Menu Shortcut: Modify Display▶ General Display Settings

General display settings change all of the display settings at the same time. Reference Table 5 - General Display Settings.

Display Setting	Description
Time and Date Display	Specify date and 24-hour vs. 12 hour format
Background Color	Specify the display panel background color
Font Settings	Changes the font setting for all of the displays.
Display Colors	Changes all of the display colors at the same time.
Language Preference	Virtual Weather Station provides limited foreign language support. To change the titles to the language of choice, edit each individual display.
Scroll Display	Ideal for monitoring the display on a television or closed circuit. You can display weather images on the entire desktop and automatically scroll.
Snap to Grid Pixels	Specify the grid resolution for aligning the weather display images.
Average Display Preferences	Allows you to chose between a one hour filtered average, the daily average, the monthly average or the yearly average on the display.

Table 5 - General Display Settings

6.12.1 Full Screen Display

To use the full screen display, double click anywhere on the background of the desktop (other than a weather element). To return to the normal display, hit any key.

Figure 15 - General Display Settings

6.13 Database

Menu Shortcut: Settings ▶ Database Settings

Virtual Weather Station generates a database for storing data for plotting and graphing. This data is stored in a comma separated file located in the following directory path:

\VWS\data\dbase.csv

where csv stands for "comma separated value". This database can be viewed, edited and deleted.

6.13.1 Database Timer

A database timer allows you to customize how often data is written to the database. The database is limited to 20,000 records, so the recommended minimum database timer is

10 minutes.

Once the database reaches 20,000 records, is automatically resized to 15,000 records. A backup record of the database is stored in the following file:

\VWS\data\yyyydbase.csv

where yyyy is the current year.

If the database is damaged or deleted, simply rename the backup database.

6.13.2 Database Format

The database format is outlined in Table 6 – Database Format.

Column Number	Parameter
1	Date, with the following format: YyyyMonthDayHourMinute
2	Wind Direction
3	Wind Speed
4	Wind Gust
5	Indoor Humidity
6	Outdoor Humidity
7	Indoor Temperature
8	Outdoor Temperature
9	Barometric Pressure
10	Total Rain
11	Channel 1 Temperature
12	Channel 1 Humidity
13	Channel 2 Temperature
14	Channel 2 Humidity
15	Channel 3 Temperature
16	Channel 3 Humidity
17	Evapotranspiration
18	UV Index (Davis) or Battery Voltage (WeatherHawk)
19	Solar Radiation
20	Wind Chill
21	Indoor Heat Index
22	Outdoor Heat Index
23	Dew Point
24	Sea-level Barometric Pressure
25	Pressure Altitude
26	Cloud Base
27	Air Density
28	Virtual Temperature
29	Vapor Pressure
30	Wind Direction Rate (per hour)
31	Wind Speed Rate
32	Wind Gust Rate
33	Indoor Humidity Rate
34	Outdoor Humidity Rate
35	Indoor Temperature Rate
36	Outdoor Temperature Rate
37	Barometric Pressure Rate
38	Total Rain Rate
39	Channel 1 Temperature Rate
40	Channel 1 Humidity Rate
41	Channel 2 Temperature Rate
42	Channel 2 Humidity Rate
43	Channel 3 Temperature Rate
44	Channel 3 Humidity Rate
45	Evapotranspiration Rate
46	UV Index Rate (Davis) or Battery Voltage (WeatherHawk)

Column Number	Parameter
47	Solar Radiation Rate
48	Wind Chill Rate
49	Indoor Heat Index Rate
50	Outdoor Heat Index Rate
51	Dew Point Rate
52	Sea-level Barometric Pressure Rate
53	Rain Daily
54	Rain Hourly
55	Last 24 Hour Rain
56	Rain Rate (Oregon Scientific Only)
57	Wind Run Daily
58	Degree Days Heating Daily
59	Degree Days Cooling Daily
60	Moon phase
61	Monthly Rain
62	Degree Days Heating Monthly
63	Degree Days Cooling Monthly
64	Wind Run Monthly
65	Degree Days Heating Yearly
66	Degree Days Cooling Yearly
67	Wind Run Yearly

Table 6 – Database Format

6.13.3 Editing and Deleting Database Records

You can recall and edit any of the database records by date or record number. Once you retrieve a database record, the data can be edited to correct errors.

6.13.4 Resizing the Database

To resize the database, select the Resize Database number. Decreasing the database size can improve the operating speed of Virtual Weather Station.

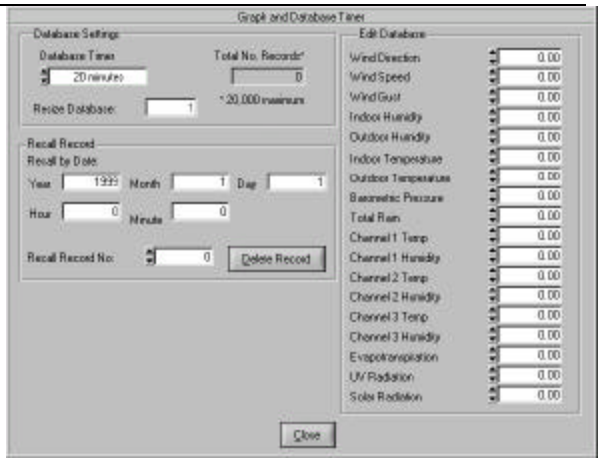


Figure 16 - Database Settings

6.14 Channel 1, 2, and 3 Optional Sensors

Optional sensors can be purchased from Ambient and displayed as Channel 1, 2 and 3 Temperature and Humidity Sensors. The following section describes the sensor part number, functionality and where to purchase.

6.14.1 Oregon Scientific WMR-918

Channel	Part No.	Description	Where to Buy
Ch 1, 2, 3 Temperature	THGR-268	Indoor / Outdoor Thermo/Hygrometer	Link
Ch 1, 2, 3 Humidity	THGR-268	Indoor / Outdoor Thermo/Hygrometer	Link

Table 7- Oregon Scientific WMR-918 Optional Sensors

6.14.2 Oregon Scientific WMR-968 (Radio Shack Wireless Weather Station)

Channel	Part No.	Description	Where to Buy
Ch 1, 2, 3 Temperature	THGR-268	Indoor / Outdoor Thermo/Hygrometer	Link
	THWR288A	Waterproof Floating Pool and Spa Thermometer	Link

Channel	Part No.	Description	Where to Buy
	THC-268	Waterproof temperature probe for pools, spas, lakes, pipes, AC Ducts	Link
Ch 1, 2, 3 Humidity	THGR-268	Indoor / Outdoor Thermo/Hygrometer	Link

Table 8- Oregon Scientific WMR-968 Optional Sensors

6.14.3 Davis Instruments Wireless Vantage Pro and Vantage Pro Plus

Channel	Part No.	Description	Where to Buy
Ch 1, 2, 3 Temperature	6370	Wireless Indoor / Outdoor Temperature Sensor with Waterproof Probe	Link
	6380	Wireless Temperature/Humidity Station with Standard Radiation Shield	Link
	6343	Wireless Leaf & Soil Moisture/Temperature Station	Link
	6361	Wireless Soil Moisture/Temperature Station	Link
Ch 1, 2, 3 Humidity (leaf wetness, soil moisture)	6343	Wireless Leaf & Soil Moisture/Temperature Station	Link
	6361	Wireless Soil Moisture/Temperature Station	Link

Table 9 – Davis Vantage Pro/Pro Plus Optional Sensors

6.14.4 Davis Instruments Wireless Vantage Pro2 and Vantage Pro2 Plus

Channel	Part No.	Description	Where to Buy
Ch 1, 2, 3 Temperature	6372	Wireless Indoor / Outdoor Temperature Sensor with Waterproof Probe	Link
	6382	Wireless Temperature/Humidity Station with Standard Radiation Shield	Link
	6345	Wireless Leaf & Soil Moisture/Temperature Station	Link
	6345CS	Complete Wireless Soil Moisture/Temperature Station	Link
Ch 1, 2, 3 Humidity (leaf wetness, soil moisture)	6345	Wireless Leaf & Soil Moisture/Temperature Station	Link
	6345CS	Complete Wireless Soil Moisture/Temperature Station	Link

Table 10 – Davis Vantage Pro2/Pro2 Plus Optional Sensors

6.15 Jpeg Files

Menu Shortcut: Settings ▶ Jpeg File Settings

Jpeg is a standard image format for web pages. Virtual Weather Station periodically creates jpeg images for inclusion in your web page, providing real time weather conditions which can be viewed from a web browser.

You can only generate jpeg images for weather displays currently on your desktop.

6.15.1 Image Quality

You can adjust the image quality of the jpeg image. Increasing the quality increases the file size. In general, the image quality is the same for 80 - 100%. The recommended quality is 80%.

6.15.2 Jpeg File Location

Specifies where the jpeg files are saved. For web server applications, save in the web server root directory.

6.15.3 Jpeg File Naming Convention

To view the filename for the jpeg image, right-mouse-click on the weather display and the jpeg filename will be displayed.

For example, the jpeg filename for the Outdoor Temperature Spectrum is wc007.jpg

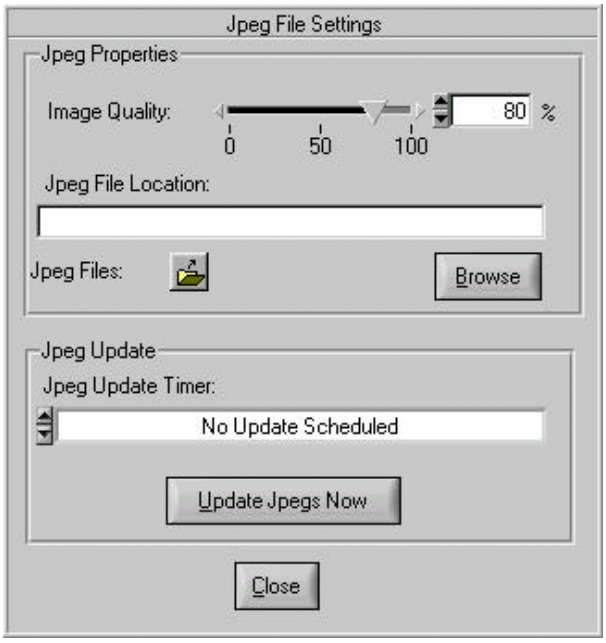


Figure 17 - Jpeg File Settings

6.16 Advanced Parameter Settings

Menu Shortcut: Settings▶ Advanced Parameter Settings

Virtual Weather Station provides the following advanced parameter settings.

6.16.1 Degree Days Heating and Cooling

Because temperature plays an important part in the rate of development of plants and many pests, a measurement which takes into account the accumulation of heat with passing time is important to predict maturation. Degree-days provide a measure for calculating the effects of temperature on the development of plants or pests.

One degree-day is the amount of heat which accumulates when the temperature remains one degree above the threshold for one day. One degree day is also the amount of heat which accumulates when the temperature is 24 degrees above the threshold for one hour.

6.16.1.1 Heating Threshold

The threshold for calculating degree-days heating.

6.16.1.2 Cooling Threshold

The threshold for calculating degree-days cooling.

6.16.2 Wind Run

Wind run is the distance wind has traveled. For example, the wind run for a constant wind speed of 20 mph for 2 hours is 40 miles, or:

Wind Run = Wind Speed * Time

There may be wind run calculation problems with specific computers due to the microprocessor and other hardware devices. If you find the wind run values are out of range, place the following line in your win.ini file:

wuseDefaultTimer=True

To reset these values, select Settings | Recall Daily, Monthly and Yearly and edit the windrun for the day, month and year.

6.16.3 Pressure Trend

Your station may not calculate the pressure trend. Virtual Weather Station will calculate the pressure trend based on your own specified threshold. If the rate of change of pressure is above this threshold, Virtual Weather Station will report rising pressure. If the rate of change of pressure is below this threshold, Virtual Weather Station will report falling pressure.

6.16.4 Wind Gust Calculation

Each weather station uses a different method for calculating wind gust. You can override your station's default method and select the maximum within a specified number of samples.

6.16.5 Filtered Average Time Constant

The time constant for the filtered average can be varied. The filter is based on a low pass filter differential equation. The output value reaches 63% of the input value after one time constant (the default time constant is 60 minutes or one hour), and will reach 95% of the input value after five time constants (default = 300 minutes or five hours).

6.16.6 New Wind Chill Calculation

On November 1, 2001, the National Weather Service (NWS) implemented a replacement Wind Chill Temperature (WCT) index for the 2001/2002 winter

season. The reason for the change was to improve upon the current WCT Index used by the NWS and the Meteorological Services of Canada (MSC, the Canadian equivalent of the NWS), which was based on the 1945 Siple and Passel Index.

The new formula made use of advances in science, technology, and computer modeling to provide a more accurate, understandable, and useful for calculating the dangers from winter winds and freezing temperatures. In addition, clinical trials have been conducted and the results of those trials have been used to verify and improve the accuracy of the new formula.

Standardization of the WCT Index among the meteorological community is important, so that an accurate and consistent measure is provided and public safety is ensured. Our goal was to implement the new wind chill formula in Canada and the United States during the same time frame in order to have a consistent WCT Index for North America.

Specifically, the new WCT index will:

- ✓ use calculated wind speed at an average height of five feet (typical height of an adult human face) based on readings from the national standard height of 33 feet (typical height of an anemometer);
- ✓ be based on a human face model;
- ✓ incorporate modern heat transfer theory (heat loss from the body to its surroundings, during cold and breezy/windy days);
- ✓ lower the calm wind threshold to 3 mph;
- ✓ use a consistent standard for skin tissue resistance; and
- ✓ assume no impact from the sun (i.e. clear night sky).

Virtual Weather Station allows you to use the old or new wind chill models. For more information, please reference the National Weather Service:

http://205.156.54.206/om/windchill/index.shtml

6.16.7 Use Channel 1 As Outdoor Temperature

Some weather stations (example, Texas Weather Instruments, Columbia Weather Systems, Davis Vantage Pro, and Oregon Scientific) exchange Channel 1 Temperature for Outdoor Temperature. In these special cases, Virtual Weather Station allows you to swap or interchange these parameters.

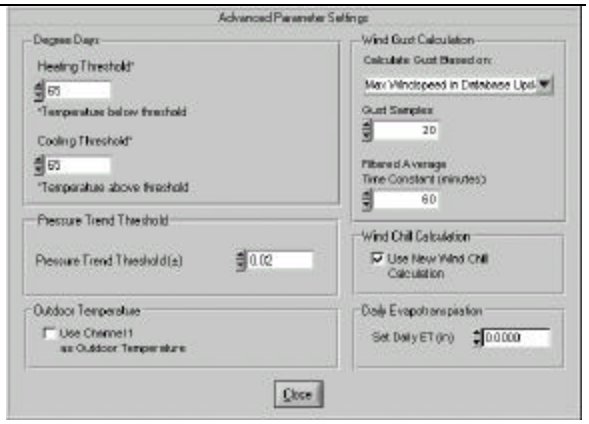


Figure 18- Advanced Parameter Settings

6.16.8 Rainfall Settings

Menu Shortcut: Settings ▶ Rainfall

Some stations calculate the daily and monthly rain.

In the event the daily and monthly rain is not calculated by the weather station, the daily rain is calculated by subtracting the minimum daily rain from the maximum daily rain. To change the daily, monthly or yearly rain, you must calculate the difference between the daily maximum and minimum rain, and enter it in the minimum rain field.

The daily rain is stored by Virtual Weather Station as the difference between the maximum daily rain and the minimum daily rain, or:

Daily Rain = Maximum Daily Rain - Minimum Daily Rain

The same is true for monthly and yearly rain.

Note that changing the daily rain does not change the monthly or yearly rain automatically. You must edit the monthly and yearly rain fields as well.

Some stations are not capable of reporting daily rain, so Virtual Weather Station must be operating 24-hours per day to capture the total amount.

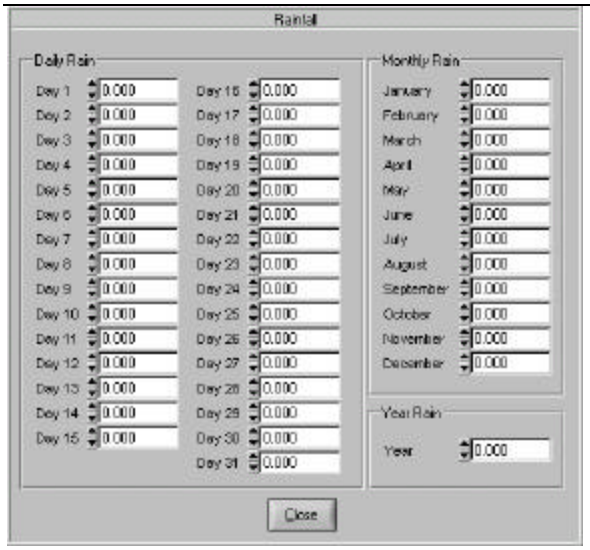


Figure 19 - Rainfall Settings

6.16.9 Dominant Wind Direction Counter

Menu Shortcut: Settings ▶ Dominant Wind Direction

Virtual Weather Station calculates the dominant wind direction based on the day, month and year. The wind direction is only counted when the wind speed is greater than 0. The dominant wind direction values can be edited. This information is summarized in the NOAA reports.

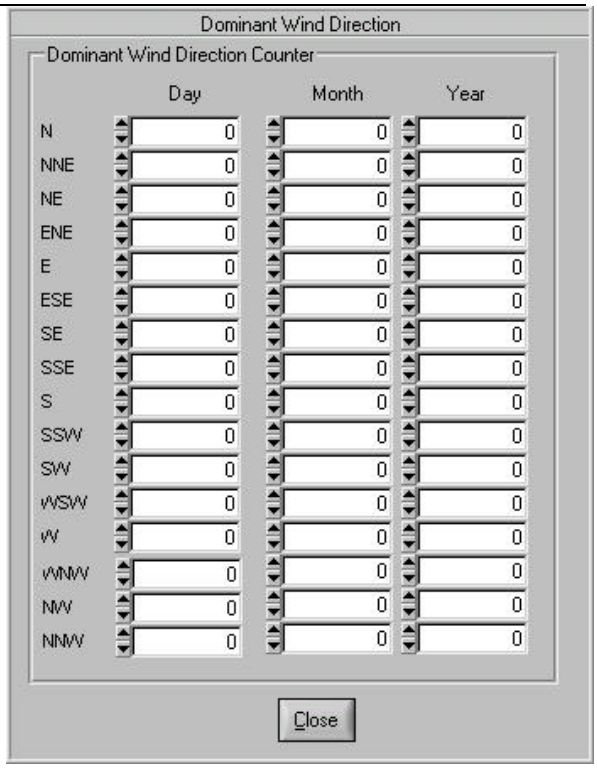


Figure 20 - Dominant Wind Direction Counter

6.16.10 Resetting Daily Minimum and Maximum Values

Menu Shortcut: Settings ▶ Reset Min and Max

You can reset the daily minimums and maximums at any time by selecting the **OK** button.

Figure 21 - Resetting Minimums and Maximums

6.17 Complete Parameter List

Menu Shortcut: Window ▶ Complete Parameter List

Table 11 provides a complete list of the parameters (1) measured by your weather station, (2) calculated by your weather station and retrieved by Virtual Weather Station, or (3) calculated by Virtual Weather Station.

6.17.1 Daily Highs and Lows

Daily highs and lows are calculated by Virtual Weather Station. Note that Virtual Weather Station must be running for the daily highs and lows to be recorded.

6.17.2 Average Values

Average values for all of the weather parameters are calculated by Virtual Weather Station based on a one hour time period. Like the daily highs and lows, Virtual Weather Station must be running for the daily highs and lows to be recorded (average values are not stored in the weather station).

When Virtual Weather Station is restarted, the average values are reset to the current value.

6.18 Rate of Change Values

Rate of change values for all of the weather parameters are calculated by Virtual Weather Station based on a one hour time period. Like the daily highs and lows, Virtual Weather Station must be running for rate of change values to be recorded.

When Virtual Weather Station is restarted, the rate of change values are reset to zero.

NOTE - Available sensors vary based on your weather station. See your weather station manual for more details.

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
1	Wind Direction	✓		
2	Wind Speed[1]	✓		
3	Wind Gust[2]	✓	or	✓
4	Indoor Humidity	✓		
5	Outdoor Humidity	✓		
6	Indoor Temperature	✓		
7	Outdoor Temperature	✓		
8	Barometric Pressure	✓		
9	Total Rain	✓		
10	Channel 1 Temperature[3]	✓		
11	Channel 1 Humidity[3]	✓		
12	Channel 2 Temperature[3]	✓		
13	Channel 2 Humidity[3]	✓		
14	Channel 3 Temperature[3]	✓		
15	Channel 3 Humidity[3]	✓		
16	Evapotranspiration[4,5]	✓		
17	UV Index[4] or Battery Votage[5]	✓		
18	Solar Radiation[4,5]	✓		
19	Wind Chill			✓
20	Indoor Heat Index			✓
21	Outdoor Heat Index			✓
22	Dew Point			✓
23	Sea-level Barometric			✓

[1] Wind Speed is displayed as wind gust on the weather station.

[2] Wind Gust is calculated from the wind gust displayed on the weather station.

[3] Optional Sensor

[4] Davis Instruments

[5] WeatherHawk

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
	Pressure			
24	Pressure Altitude			✓
25	Cloud Base Height			✓
26	Density Altitude			✓
27	Virtual Temperature			✓
28	Vapor Pressure			✓
29	Wind Direction Rate			✓
30	Wind Speed Rate			✓
31	Wind Gust Rate			✓
32	Indoor Humidity Rate			✓
33	Outdoor Humidity Rate			✓
34	Indoor Temperature Rate			✓
35	Outdoor Temperature Rate			✓
36	Barometric Pressure Rate			✓
37	Total Rain Rate			✓
38	Channel 1 Temperature Rate[3]			✓
39	Channel 1 Humidity Rate[3]			✓
40	Channel 2 Temperature Rate[3]			✓
41	Channel 2 Humidity Rate[3]			✓

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
24	Pressure Altitude			✓
25	Cloud Base Height			✓
26	Density Altitude			✓
27	Virtual Temperature			✓
28	Vapor Pressure			✓
29	Wind Direction Rate			✓
30	Wind Speed Rate			✓
31	Wind Gust Rate			✓
32	Indoor Humidity Rate			✓
33	Outdoor Humidity Rate			✓
34	Indoor Temperature Rate			✓
35	Outdoor Temperature Rate			✓
36	Barometric Pressure Rate			✓
37	Total Rain Rate			✓
38	Channel 1 Temperature Rate[3]			✓
39	Channel 1 Humidity Rate[3]			✓
40	Channel 2 Temperature Rate[3]			✓
41	Channel 2 Humidity Rate[3]			✓

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
42	Channel 3 Temperature Rate[3]			✓
43	Channel 3 Humidity Rate[3]			✓
44	Evapotranspiration Rate[4,5]			✓
45	UV Index Rate[4] or Battery Voltage Rate[5]			✓
46	Solar Radiation Rate[4,5]			✓
47	Wind Chill Rate			✓
48	Indoor Heat Index Rate			✓
49	Outdoor Heat Index Rate			✓
50	Dew Point Rate			✓
51	Sea-level Barometer Rate			✓
52	Wind Direction Avg.			✓
53	Wind Speed Avg.			✓
54	Wind Gust Avg.			✓
55	Indoor Humidity Avg.			✓
56	Outdoor Humidity Avg.			✓
57	Indoor Temperature Avg.			✓
58	Outdoor Temperature Avg.			✓
59	Barometric Pressure Avg.			✓

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
60	Total Rain Avg.			✓
61	Channel 1 Temperature Avg.[3]			✓
62	Channel 1 Humidity Avg.[3]			✓
63	Channel 2 Temperature Avg.[3]			✓
64	Channel 2 Humidity Avg.[3]			✓
65	Channel 3 Temperature Avg.[3]			✓
66	Channel 3 Humidity Avg.[3]			✓
67	Evapotranspiration Avg[4,5]			✓
68	UV Index Avg[4] or Battery Voltage Avg[5]			✓
69	Solar Radiation Avg[4,5]			✓
70	Wind Chill Avg.			✓
71	Indoor Heat Index Avg.			✓
72	Outdoor Heat Index Avg.			✓
73	Dew Point Avg.			✓
74	Sea-level Barometer Avg.			✓
75	Wind Direction Daily High			✓
76	Wind Speed Daily High			✓
77	Wind Gust Daily High			✓

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
78	Indoor Humidity Daily High			✓
79	Outdoor Humidity Daily High			✓
80	Indoor Temperature Daily High			✓
81	Outdoor Temperature Daily High			✓
82	Barometric Pressure Daily High			✓
83	Total Rain Daily High			✓
84	Channel 1 Temperature High[3]			✓
85	Channel 1 Humidity High[3]			✓
86	Channel 2 Temperature High[3]			✓
87	Channel 2 Humidity High[3]			✓
88	Channel 3 Temperature High[3]			✓
89	Channel 3 Humidity High[3]			✓
90	Evapotranspiration High[4,5]			✓
91	UV Index High[4] or Battery Voltage High[5]			✓
92	Solar Radiation High[4,5]			✓
93	Wind Chill Daily High			✓
	Daily High			
94	Indoor Heat Index Daily High			✓
95	Outdoor Heat Index Daily High			✓
96	Dew Point Daily High			✓
97	Sea-level Barometer High			✓
98	Wind Direction Daily Low			✓
99	Wind Speed Daily Low			✓
100	Wind Gust Daily Low			✓
101	Indoor Humidity Daily Low			✓
102	Outdoor Humidity Daily Low			✓
103	Indoor Temperature Daily Low			✓
104	Outdoor Temperature Daily Low			✓
105	Barometric Pressure Daily Low			✓
106	Total Rain Daily Low			✓
107	Channel 1 Temperature Low[3]			✓
108	Channel 1 Humidity Low[3]			✓
109	Channel 2 Temperature			✓

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
	Low[3]			
110	Channel 2 Humidity Low[3]			✓
111	Channel 3 Temperature Low[3]			✓
112	Channel 3 Humidity Low[3]			✓
113	Evapotranspiration Low[4,5]			✓
114	UV Index Low[4] or Battery Voltage Low[5]			✓
115	Solar Radiation Low[4,5]			✓
116	Wind Chill Daily Low			✓
117	Indoor Heat Index Daily Low			✓
118	Outdoor Heat Index Daily Low			✓
119	Dew Point Daily Low			✓
120	Sea-level Barometer Low			✓
121	Daily Rain			✓
122	Hourly Rain			✓
123	Last 24 Hour Rain		✓	
124	Rain Rate		✓	
125	Daily Wind Run			✓
126	Daily Degree Days Heating			✓
127	Daily Degree Days Cooling			✓

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
110	Channel 2 Humidity Low[3]			✓
111	Channel 3 Temperature Low[3]			✓
112	Channel 3 Humidity Low[3]			✓
113	Evapotranspiration Low[4,5]			✓
114	UV Index Low[4] or Battery Voltage Low[5]			✓
115	Solar Radiation Low[4,5]			✓
116	Wind Chill Daily Low			✓
117	Indoor Heat Index Daily Low			✓
118	Outdoor Heat Index Daily Low			✓
119	Dew Point Daily Low			✓
120	Sea-level Barometer Low			✓
121	Daily Rain			✓
122	Hourly Rain			✓
123	Last 24 Hour Rain		✓	
124	Rain Rate		✓	
125	Daily Wind Run			✓
126	Daily Degree Days Heating			✓
127	Daily Degree Days Cooling			✓

Table 11 - Complete Parameter List

No.	Parameter Name	Measured by Station	Calculated by Station	Calculated by VWS
128	Moon Phase			✓
129	Monthly Rain			✓
130	Monthly Degree Days Heating			✓
131	Monthly Degree Days Cooling			✓
132	Monthly Wind Run			✓
133	Yearly Degree Days Heating			✓
134	Yearly Degree Days Cooling			✓
135	Yearly Wind Run			✓
136	Stress Index			✓
137	Comfort Index			✓
138	Forecast		✓	
139	Pressure Condition (Rising/Falling)		✓[6]	
140	Barometric Pressure Condition (Rising / Falling)			✓
141	Beaufort Scale			✓
142	Date			✓
143	Time			✓
144	Sunrise			✓
145	Sunset			✓
146	Moonrise			✓
147	Moonset			✓

[6] Reported by WM-918 and WX-200 weather stations only

6.19 Daily, Monthly and Yearly Summary

Virtual Weather Station provides a daily, monthly and yearly summary. The high, low, averages and integrated values are recorded as well as the time and date of the highs and lows. You can edit the daily extremes. The summary data is independent of the database as described in Chapter 6.13 - Database.

6.19.1 Recalling the Daily, Monthly and Yearly Summary

Menu Shortcut: Settings ▶ Recall Daily, Monthly and Yearly Archive

To recall the daily, you will be prompted for a file with the following format:

- ✓ 2001, which corresponds to the yearly extremes, averages and rates for the year 2001.
- ✓ 2001_10, which corresponds to the monthly extremes, averages and rates for October 2001.
- ✓ 2001_10_01, which corresponds to the daily extremes, averages and rates for October 1, 2001.

6.19.2 Daily Summary

Figure 22 - Daily Summary provides a daily summary of the high, low, average and integrated (degree day and wind run) values for the day. The values can be changed by entering the new number in the text field (with the exception of the predominant wind direction).

The display includes the number of samples for the day. This panel is updated every minute.

To review data from a previous date, enter the month, day and year in the **Recall Archive Record** text field.

6.19.3 Monthly Summary

Provides a monthly summary of the high, low, average and integrated (degree day and wind run) values for the month. The values can be changed by entering the new number in the text field (with the exception of the predominant wind direction).

The display includes the number of samples for the month. This panel is updated hourly.

6.19.4 Yearly Summary

Provides a yearly summary of the high, low, average and integrated (degree day and wind run) values for the year. The values can be changed by entering the new number in

the text field (with the exception of the predominant wind direction).

The display includes the number of samples for the year. This panel is updated hourly.

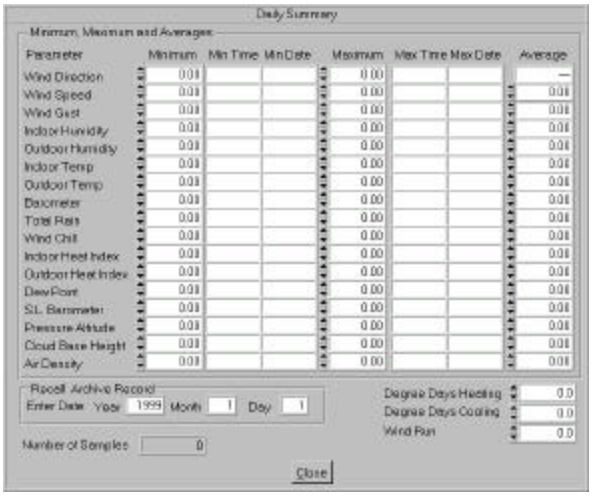


Figure 22 - Daily Summary

6.20 Alarms and Memory (WM-918 and WX-200 only)

Menu Shortcut: Settings ▶ Alarms and Memory

The WX-200 and WM-918 stations provide alarm and historical high and low data. The battery status is also shown in this window.

Figure 23- Alarms and Memory (WM-918 and WX-200 only)

6.21 Icon Settings

Menu Shortcut: Settings ▶ Icon Settings

The forecast icon can be updated manually or automatically by several means. To view the icon, select the **Display Icon** checkbox. The icon is also displayed and updated in the **Broadcast Display**.

6.21.1 Display Attributes

The icon displays the current temperature. The color, units and precision of the displayed temperature can be changed. The icon frame width and color can also be modified.

6.21.2 Icon Automation

The icons can be updated manually or automatically as described in the following paragraphs.

6.21.2.1 Manually Updating the Icon

To manually update the icon, select **Icon Automation None** and select the weather conditions from the Weather Conditions pull menu.

6.21.2.2 Update Icon Based on Weather Station Prediction

To update the icon based on the weather station's prediction, select **Icon Automation Weather Station Prediction**.

The Davis Vantage Pro, Oregon Scientific and Radio Shack weather stations include forecast predictions. The predictions are based on trends, and predict the weather 24-48 hours in advance, accurate to approximately 75%.

The Davis Instruments Vantage Pro provides an extended forecast of 192 different conditions or rules.

To view this extended forecast, select **Menu Shortcut: Modify Display ▶ Alphanumeric ▶ Forecast.**

6.21.2.3 Update Icon Based on METAR Station (Internet Version only)

The icon can be updated based on the selected METAR station in your area. For more information, reference section 8.17.

6.21.2.4 Update Icon Based on Smart Forecast

Reference Section 6.22 for more information on this option.

6.21.3 Jpeg Settings

Select this option to create a jpeg image of the forecast icon for insertion into your webpage.

6.21.4 Editing Icon Images

The icon images are located in the following directories:

Daytime: \vws\icons\day

Nighttime: \vws\icons\night

You can create your own icons to replace the icons provided with the distribution kit. Make sure you save these icons as “read only” to prevent Virtual Weather Station from overwriting at the next installation of Virtual Weather Station.

Figure 24 - Icon Settings

6.22 Smart Forecast

Menu Shortcut: Settings ▶ Smart Forecast

The Smart Forecast option allows you to display current weather conditions based on your own prediction. For example, if the rate of change of pressure is increasing rapidly, the weather is generally clearing. If the rate of change of rainfall is increasing, light rain, rain or heavy rain can be displayed. Fog or mist can be displayed based on temperature and humidity.

6.22.1 Smart Forecast Settings

Priority. The Smart Forecast is prioritized based on the Priority number, where 1 has the highest priority. Boolean settings have priority over the individual settings.

Active. Activate the smart forecast.

Parameter. Specify the forecast parameter

Condition. Greater than (>) or less than (<). Specify the condition required for forecast to be active.

Value. The value compared against the parameter.

Forecast. The forecast if the condition is met.

ON. The condition is met if the LED is red.

6.22.2 Boolean Settings

Boolean settings allow you to set conditions based on multiple parameters defined in the Smart Forecast section. Note that the Smart Forecast parameters need not be active to be used in the Boolean Settings.

Priority. The smart forecast is prioritized based on the Priority number, where 1 has the highest priority. Boolean settings have priority over the individual settings.

Active. Activate the boolean forecast.

P1. Parameter 1 as defined in the smart forecast section.

P2. Parameter 2 as defined in the smart forecast section.

Condition. (AND) or (OR). Specify the condition required for forecast to be active.

For example, if Parameter 1 and Parameter 2 are TRUE, select P1 AND P2.

Value. The value compared against the parameter.

Forecast. The forecast if the condition is met.

ON. The condition is met if the LED is red.

Figure 25 - Smart Forecast Settings

6.23 Alarms

Menu Shortcut: Settings ▶ Alarms

NOTE: You must have a properly functioning sound card for this feature to work.

You can progr am Virtual Weather Station to play a wav sound, launch an executable or send an EMail when a specific alarm condition occurs. For example, play a wind chime when the wind speed limit is exceeded, a lightning

sound when the rain rate is exceeded, or a bird chirp when the temperature is high enough to open windows in the house. In addition, you can run an executable or batch file when a condition is exceeded.

6.23.1 Alarm Settings

Parameter. Specify the alarm parameter

Condition. Specify the condition required for the alarm to sound.

Example:

"Send an alarm when the Outside Temperature is less than 70.00"

Outside Temperature < 70.00

"Send an alarm when the Wind Speed is greater than 20.00"

Wind Speed > 20.00

Sound (Wav) or Exectutable (exe, com, bat) Filename. Specify the wav file to play or the executable to run.

VWS includes sample wav files in the sounds sub-directory.

Reference Section 6.23.2 for details on launching executable or batch files.

Browse. Browse to the wav file location.

Alarm LED. LED Displays RED when the alarm condition is met. Otherwise, the alarm LED will remain gray.

Alarm Timer. Specifies the frequency you wish to sound the alarm. The alarm is also played at start-up.

6.23.2 Launching Executable or Batch Files

VWS starts running a program and returns without waiting for it to exit. The executable can be either an MS DOS or MS Windows executable, including *.exe, *.com, *.bat and *.pif files.

If you need to execute a command built into command.com such as copy, dir, etc, you can call "command.com /C DosCommand args",

where DosCommand is the shell command you want to be executed.

For example, "command.com /C copy c:\\temp\\file.tmp c:\\tmp" would copy file.tmp from the temp directory to the tmp directory. Refer to your DOS documentation for further help with command.com.

.exe, .com, and .bat DOS programs use the settings in default.pif (in your Windows directory) when running. You can change their priority, display options, etc., by editing default.pif or by creating another pif file. Refer to your Microsoft Windows documentation for help on creating and editing pif files.

Figure 26 - Alarm Sound Settings

6.24 Synchronize Date and Time

Menu Shortcut: Settings ▶ Synchronize Date and Time

Your computer may lose time because of accuracy of the ROM BIOS. Virtual Weather Station allows you to synchronize your computer clock to the Weather Station's clock automatically. This is particularly useful because the WMR-918 and WMR-968 are equipped with the RF Clock feature that synchronizes to the atomic clock (this feature is available with the European model only).

Check your WMR-918 / 968 Weather Station Instruction Manual for more details on this feature.

Note that you must be the Administrator for this function to work on an NT based machine.

The WM-918 station does not report the year, so careful attention must be taken at the beginning of each year.

6.25 Desktop Options

6.25.1 The Taskbar

Virtual Weather Station displays an icon on your taskbar. To hide Virtual Weather Station, double click the Virtual Weather Station icon on your taskbar. To display Virtual Weather Station when hidden, double click on the Virtual Weather Station icon again.

6.25.2 The Toolbar

Virtual Weather Station displays the following parameters on your toolbar (when minimized only):

Outdoor Temperature Outdoor Humidity Wind Direction @ Wind Speed

6.26 Rainwise Settings

The Rainwise Weather Station includes a programmable data logger. Reference Figure 27 - Rainwise Settings. The following settings can be adjusted.

6.26.1 Sea-level Barometer Adjustment (418 MHz systems only)

The sea-level barometer setting can be adjusted in the Rainwise Computer Interface. In addition, the barometer. You can also adjust the barometer in the calibration offset. See Section 6.2 for more details.

6.26.2 Reset Barom to Absolute Pressure

Removes the sea-level offset adjustment

6.26.3 Reset Daily Min/Max Data

All minimum and maximum sensor values are set to the current sensor values and the current time. Note that the minimum and maximum values are automatically logged to memory and reset daily and midnight.

6.26.4 Reset Daily and Monthly Rainfall

Resets the daily and monthly rainfall in the logger's memory.

6.26.5 Reset Total Rainfall to Zero

Resets the total rainfall to zero in the logger's memory

6.26.6 Reset High Windspeed

Resets the high windspeed to zero in the logger's memory

6.26.7 Clear All Logged Data

Clears all of the data in the data logger's memory.

6.26.8 No. Items Logged

The number of items logged (proceeded by the cursor prompt >).

6.26.9 Update Computer Interfaces Clock

Updates the computer interfaces clock, with the following format:

- ✓ MMDDhhmmss
- ✓ Where MM is month
- ✓ DD is day
- ✓ hh is hour (24 hour time)
- ✓ mm is minute
- ✓ ss is second

6.26.10 Increment Logging Interval

The computer interface switches to the next logging interval, and outputs the new value below.

1, 2, 5, 10, 15, 20, 30, or 60 minutes

6.26.11 Battery Voltage

Sensor package battery voltage

6.26.12 Version

EEPROM revision code for the interface and sensor package.

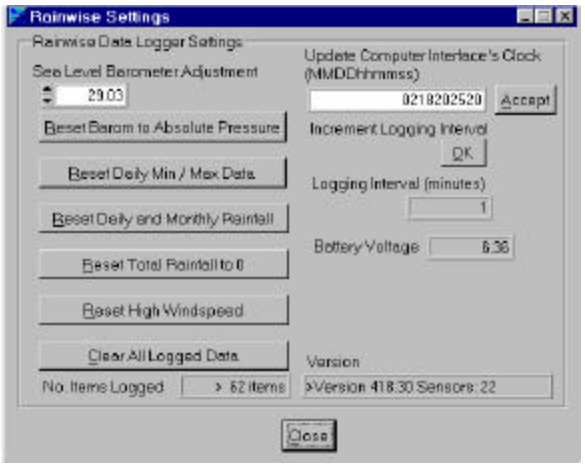


Figure 27 - Rainwise Settings

6.27 Rainwise Data Logger

Your Rainwise Computer Interface is equipped with a Data Logger. Each time the program starts, Virtual Weather Station downloads the data recorded since the last time the software communicated to the Rainwise Computer Interface. Each recorded data point will be updated to the display.

6.28 Vantage Pro / Weather Link Settings

6.28.1 Vantage Pro Settings

Menu Shortcut: Settings ▶ Vantage / WeatherLink Settings

The Davis weather station console can be programmed for calibration offsets, barometric pressure sea-level correction, and setting date and time.

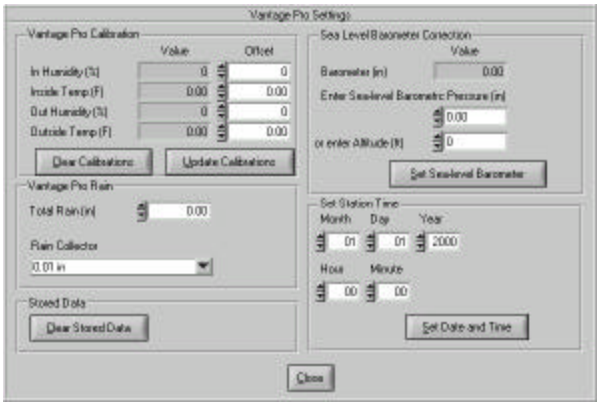


Figure 28 – Vantage/WeatherLink Settings

6.28.2 Vantage / WeatherLink Highs and Lows

Menu Shortcut: Settings ▶ Vantage Highs and Lows

The highs and lows are stored in the Davis weather station console. You can automatically reset these highs and lows (Weather Monitor II and Weather Wizard III only) at a given time of day based on the schedule.

Figure 29 – Vantage / WeatherLink Recorded Highs and Lows

6.28.3 Vantage / WeatherLink Alarm Settings

Menu Shortcut: Settings ▶ Vantage Alarm Settings

Davis weather station console audible alarms can be set and cleared.

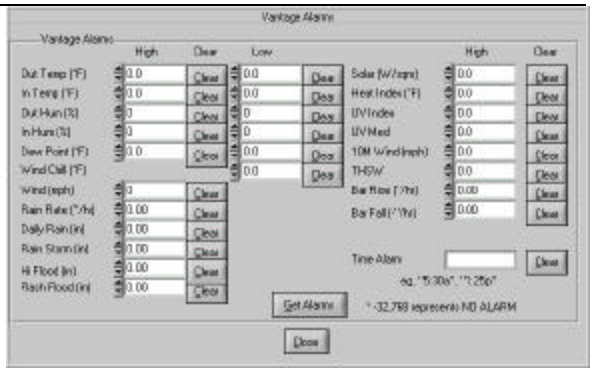


Figure 30 – Vantage / WeatherLink Alarms

6.29 WeatherHawk Settings

Menu Shortcut: Settings ▶ WeatherHawk Settings

6.29.1 Address Settings

Define the PC Address, Logger Address, Timeout period in seconds and number of retries.

6.29.2 Advanced Program

Launches WHawk executable, a firmware programming utility provided by WeatherHawk.

6.29.3 Variable Settings

Set and Get Longitude, Latitude, Altitude (in meters), Crop Coefficient and Barometric Pressure Sea-level calibration offset (kPa).

6.29.4 Time and Date Settings

Set and Get the WeatherLink logger date and time.

Select the Synchronize WeatherHawk to Computer Time option to synchronize the weather station time to the computer time.

6.29.5 Download Settings

6.29.5.1 Bypass Download at Start-up

Virtual Weather Station automatically downloads all of the data stored in the logger at start-up. To bypass the download at start-up, select this option.

6.29.5.2 Clear Memory After Start-up

Clears the archived memory after each download at start-up of Virtual Weather Station.

6.29.5.3 Cancel Download Data

Cancels the current download

6.29.5.4 Last Download Record

Provides a marker for the last record downloaded from archive memory. The next time Virtual Weather Station is launched, the next record will be downloaded.

6.29.6 Reset

6.29.6.1 Reset Total Rain

Resets the total rain stored in the WeatherHawk memory.

6.29.6.2 Clear All Memory

Clears all of the memory and settings in the WeatherHawk firmware.

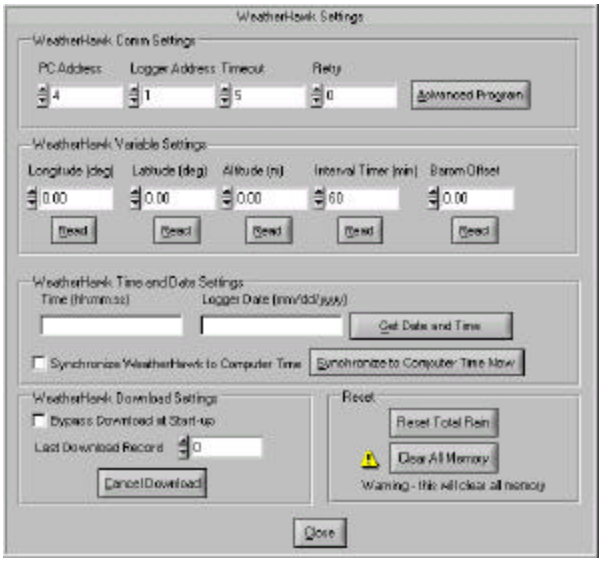


Figure 31 – WeatherHawk Settings

6.30 LaCrosse 2300, Lacrosse 2310, LaCrosse 2315, La Crosse 3600 and La Crosse 3610 Settings

Menu Shortcut: Settings ▶ La Crosse Technology Settings

The La Crosse Technology computer interface does not pass both the corrected (relative or sea-level) pressure, and the measured (absolute) pressure, so the difference in these pressures must be entered each time the corrected pressure is modified in the console.

To determine these values: select the barometer display on your weather station monitor and toggle between REF and ABS and enter the values into Virtual Weather Station.

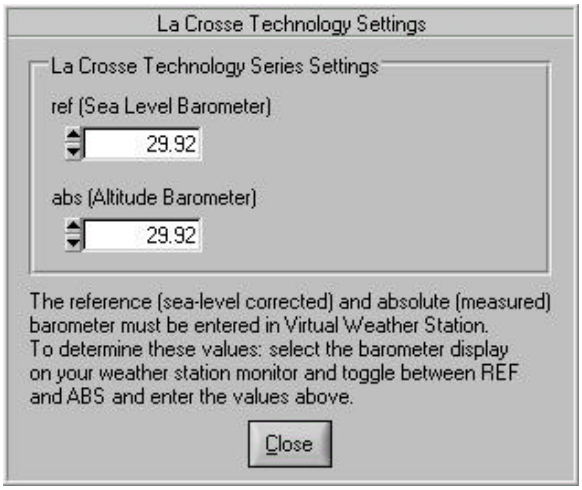

La Crosse Technology Settings
La Crosse Technology Series Settings
ref (Sea Level Barometer)
29.92
abs (Altitude Barometer)
29.92
The reference (sea-level corrected) and absolute (measured) barometer must be entered in Virtual Weather Station.
To determine these values: select the barometer display on your weather station monitor and toggle between REF and ABS and enter the values above.
Close

Figure 32 – La Crosse Technology Weather Station Settings

6.31 Other Display Features

6.31.1 Minimizing the Program and Display

When the display is minimized, the title bar displays the outdoor temperature, humidity, wind direction and windspeed on the taskbar.

Figure 33 – Minimized Taskbar Display

6.31.2 Hiding Virtual Weather Station

To hide Virtual Weather Station, double click on the Taskbar icon. To display after hiding, double click on the taskbar.

Figure 34 – Virtual Weather Station Taskbar Icon

6.32 WeatherLink Automation (Davis Instruments only)

Menu Shortcut: Settings ▶ WeatherLink / PCLink Automation

You can automatically download data to the WeatherLink program using Virtual Weather Station. This assures that data is stored in both programs for users that wish to

continue the WeatherLink database.

Enter Your Station Directory, the location of the WeatherLink executable file, and select if you want to automatically generate NOAA monthly and yearly summary reports within WeatherLink.

Enter a scheduled time to automate the process.

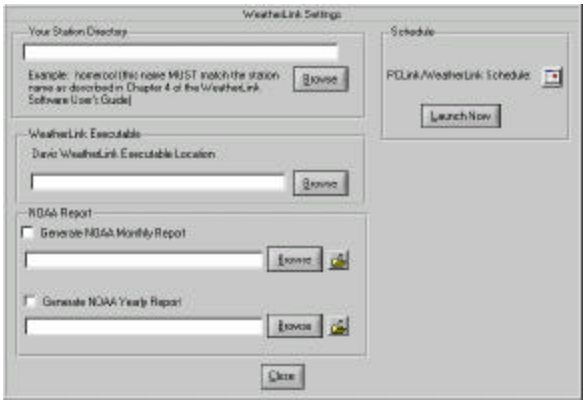


Figure 35 – WeatherLink Settings

6.33 WeatherVoice

Turn any PC into a Weather Report Telephone Call Center with Ambient's WeatherVoice Plug-in.

Anyone can keep up to date on your local weather, anywhere. Advertise your services, keep a watchful eye on your home, cabin or business, indoors and out, with a simple phone line and voice modem.

Ambient makes this possible with Virtual Weather Station's Voice Generation System

Virtual Weather Station's WeatherVoice is a text to speech converter. WeatherVoice is compatible with most text-to-speech voices.

These text files can be automatically updated, inserting real-time weather conditions from your weather station, or even forecasts and warnings from the National Weather Service.

With WeatherVoice, you can:

Use Virtual Weather Station's File Tags to insert live weather conditions from your weather station or your local METAR station into your outgoing answering message

Download from the Internet and insert any text file into the outgoing answering message to provide weather forecasts and warnings

Use spoken audio files as background sounds on your website

Combine with a third party PC Auto Call Center to provide a complete PC-based phone answering system. Keep up to date on your local weather, advertise your service, and stay connected to the weather!

6.33.1 What you Need to Get Started

You need the following to create a sophisticated Weather Reporting Call Center:

A personal weather station, or Internet connection to over 7,000 METAR weather stations around the world

Ambient's Virtual Weather Station Base, Pro or Internet Edition

Ambient's WeatherVoice Plug-in

A Voice Modem. Most modems provide Voice/Data/Fax

A third party Call Center Software. We recommend ***Advanced Call Center***:

http://www.voicecallcentral.com/advancedcallcenter.htm

6.33.2 Configuring WeatherVoice

WeatherFlash converts text files with "tags" into actual weather data, and then converts these files into wav files, which can be played back on your computer or voice modem. "File Tags" can also be inserted into the text file.

An example text file is as follows:

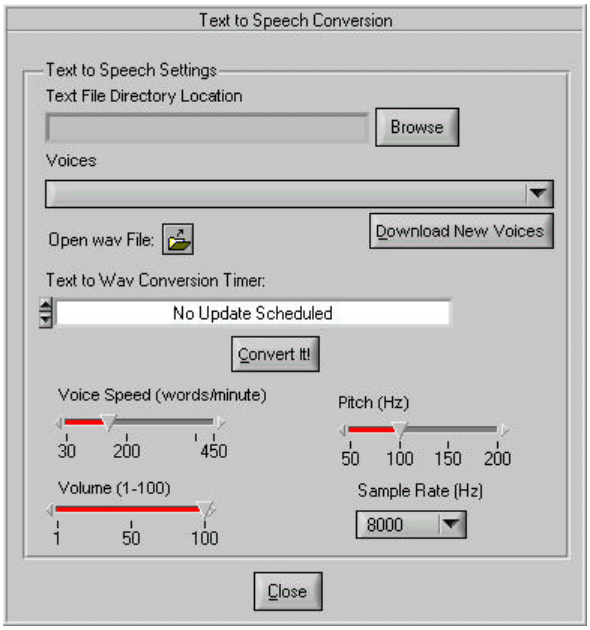


Figure 36 - WeatherVoice Set-up

7 Virtual Weather Station Pro Edition

7.1 File Settings (Data Logging)

Menu Shortcut: Settings ▶ File Settings

Virtual Weather Station includes a data logger, which provides a permanent record of your weather data.

The data is stored in several file formats:

- ✓ Report Format. Provides formatted data for viewing (daily file)
- ✓ Comma Separated Data (csv) format. This format is for export to Microsoft Excel or other analysis programs.
- ✓ Archive Format. This format provides the highs, lows and average for the day, month and year.

7.1.1 Daily File

The Daily File is a text file stored in the following location:

\VWS\data\daily\daily.txt

This file is recreated every day. The file is formatted with data organized into fixed column widths. This format is ideal for display purposes.

Since the file name never changes (daily.txt), it can be statically linked from web pages or other files.

7.1.2 Date Stamped File

To create a new date stamped file every day, select this checkbox, as shown in Figure 39 - File Settings. The data is stored in the following location:

\VWS\data\daily\yyyymmdd.txt

where yyyy is the year, mm is the month and dd is the day.

For example, data stored on May 9, 2000 is designated by the filename:

\VWS\data\20000509.txt

The date stamped format is the same as the daily.txt format.

7.1.3 Csv File

A csv file (comma separated file) is a standard format for reading data into Excel (for example). Excel recognizes csv format and parses the data into separate columns.

To create a csv file, select the checkbox as shown in Figure 39 - File Settings.

The data is stored in the following location:

\VWS\data\csv\yyyymmdd.csv

where yyyy is the year, mm is the month and dd is the day.

For example, data stored on May 9, 2000 is designated by the filename:

\VWS\data\csv\20000509.csv

7.1.4 Archive File

The archive text files consist of highs, lows and averages for archived data on a daily, monthly and yearly basis. An example of this file is shown in Figure 37 – Archived Data Text File.

Parameter	Max	Max Time	Min	Min Time	Average
Wind Direction	353	4:31pm	140	4:11pm	250
Wind Speed	5.1	3:08pm	0.0	2:18pm	1.4
Wind Gust	6.5	2:42pm	0.0	3:09pm	2.3
In Humidity	42	2:18pm	30	3:09pm	34
Humidity	42	4:11pm	30	3:09pm	34
In Temp	74.7	4:46pm	50.0	3:09pm	59.6
Out Temp	76.3	2:18pm	70.0	3:09pm	73.5
Barometer	29.03	2:18pm	29.00	3:09pm	29.01
Total Rain	1.02	2:18pm	0.00	2:18pm	0.82
Ch 1 Temp	0.0	2:18pm	0.0	2:18pm	0.0
Ch 1 Humidity	0	2:18pm	0	2:18pm	0
Ch 2 Temp	0.0	2:18pm	0.0	2:18pm	0.0
Ch2 Humidity	0	2:18pm	0	2:18pm	0
Ch 3 Temp	0.0	2:18pm	0.0	2:18pm	0.0
Ch 3 Humidity	0	2:18pm	0	2:18pm	0

Wind Chill	76.3	2:18pm	60.0	3:09pm	63.4
In Heat Ix	74.7	4:46pm	65.2	3:09pm	69.2
Out Heat Ix	75.7	2:18pm	66.2	3:09pm	69.1
Dew Point	46.7	4:11pm	39.0	3:09pm	40.2
SL Barometer	29.03	2:18pm	29.00	4:49pm	29.01

Figure 37 – Archived Data Text File

7.1.4.1 Daily Archive Files

The daily archive files are stored in the following location:

- ✓ \VWS\data\archive\daily\dailyarc.txt

7.1.4.1.1 Previous Daily Files

1-5 day old daily files are stored as follows:

- ✓ \VWS\data\archive\daily\daily_2.txt . Yesterdays daily archive file
- ✓ \VWS\data\archive\daily\daily_3.txt. Two days ago
- ✓ \VWS\data\archive\daily\daily_4.txt. Three days ago.

7.1.4.2 Monthly Archive Files

The daily archive files are stored in the following location:

- ✓ \VWS\data\archive\monthly\monthlyarc.txt

7.1.4.3 Yearly Archive Files

The daily archive files are stored in the following location:

- ✓ \VWS\data\archive\yearly\yearlyarc.txt

7.1.5 Date Stamped Archive File

Date stamped archive files are ideal for storing historical data.

To create a new date stamped archive file every day, select this checkbox, as shown in Figure 39 - File Settings.

7.1.5.1 Date Stamped Archive Daily Files

The data is stored in the following location:

- ✓ \VWS\data\archive\daily\yyyymmdd.txt

where yyyy is the year, mm is the month and dd is the day.

For example, data stored on May 9, 2000 is designated by the filename:

- ✓ \VWS\data\archive\20000509.txt

The date stamped format is the same as the daily.txt format.

7.1.5.1.1 Previous Daily Files

1-5 day old daily files are stored as follows:

- ✓ \VWS\data\archive\daily\daily_2.txt . Yesterdays daily text file
- ✓ \VWS\data\archive\daily\daily_3.txt. Two days ago
- ✓ \VWS\data\archive\daily\daily_4.txt. Three days ago.

7.1.5.2 Date Stamped Archive Monthly Files

The data is stored in the following location:

- ✓ \VWS\data\archive\monthly\yyyymm.txt

where yyyy is the year, mm is the month.

For example, data stored on May, 2000 is designated by the filename:

1. \VWS\data\archive\20000.txt

The monthly stamped format is the same as the monthly.txt format.

7.1.5.3 Date Stamped Archive Yearly Files

The data is stored in the following location:

- ✓ \VWS\data\archive\daily\yyyy.txt

where yyyy is the year.

For example, data stored for the year 2000 is designated by the filename:

- ✓ \VWS\data\archive\yearly\2000.txt

The year stamped format is the same as the yearly.txt format.

7.1.6 Summary Files

This file provides a summary of the average, high and low values for each parameter specified in the File Parameter List (reference Section 7.1.8).

The file is stored in the following location:

- ✓ \vws\data\summary\daysum.txt

An example is shown in Figure 38 – Example Daily Summary File.

Date	Humidity	Hi	Lo	Temp	Hi	Lo
10/11/2001	78	100	29	63	82	49
10/12/2001	52	100	8	68	86	51
10/13/2001	35	76	13	70	90	53
10/14/2001	60	95	14	66	92	49
10/15/2001	68	100	15	67	91	50
10/16/2001	73	100	21	66	87	52
10/17/2001	78	100	24	62	82	47
10/18/2001	75	100	16	62	82	47
10/19/2001	83	100	27	62	83	49

Figure 38 – Example Daily Summary File

7.1.7 File Update Timer

Specify the update or record rate of the data to file.

7.1.8 Create / Modify File List

Virtual Weather Station allows you to record over 90 different parameters. Select the parameters for recording from this list.

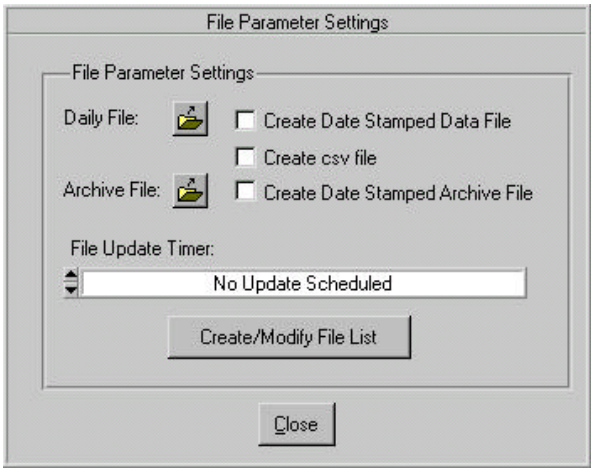


Figure 39 - File Settings

7.2 CSV File Export

Real-time Data can be exported to a csv file for other programs to utilize. Two files are created:

data.csv – this file uses the native units as described in Figure 40 – CSV Output File Format.

data2.csv – this file uses the converted units as specified by the user (example, °C for temperature)

The data is formatted as follows:

1.00,2001,10,28,0,6,59,0,0,48,42,100,77,53,30,30.14,0.76,0.00,0,0,0,0,0,0,0,0.00,0,0,53,77,53,53,0.000,52,0,0,0

Column	Identifier	Prototype
1	Csv File Version ID (XX.XX)	Floating Point
2	Year (yyyy format)	Integer
3	Month	Integer
4	Day	Integer
5	Hour (24-hour format)	Integer
6	Minute	Integer
7	Second	Integer
8	Wind speed (mph)	Floating Point
9	Wind Gust (mph)	Floating Point
10	Wind Direction (degrees)	Floating Point
11	Inside Humidity (%)	Floating Point
12	Outside Humidity (%)	Floating Point
13	Inside Temperature (°F)	Floating Point
14	Outside Temperature (°F)	Floating Point

Column	Identifier	Prototype
	(°F)	
15	Barometer (in)	Floating Point
16	Total Rain (in)	Floating Point
17	Daily Rain (in)	Floating Point
18	Hourly Rain (in)	Floating Point
19	Weather Condition, where: 0 = clear 1 = few clouds 2 = scattered clouds 3 = broken clouds 4 = overcast 5 = drizzle 6 = rain 7 = frozen rain 8 = showers 9 = mist 10 = tornado 11= fog 12 = smoke 13 = hail 14 = haze 15 = ice crystals 16 = sand 17 = snow grains 18 = snow 19 = snow showers 20 = lightning 21 = thundershowers	Integer
20	Channel 1 Temperature (WMR-968/WMR-918, Davis Vantage Pro)	Floating Point
21	Channel 1 Humidity (WMR-968/WMR-918 only)	Floating Point
22	Channel 2 Temperature (WMR-968/WMR-918, Davis Vantage Pro)	Floating Point
23	Channel 2 Humidity (WMR-968/WMR-918, Davis Vantage Pro)	Floating Point
24	Channel 3 Temperature (WMR-968/WMR-918, Davis	Floating Point

Column	Identifier	Prototype
15	Barometer (in)	Floating Point
16	Total Rain (in)	Floating Point
17	Daily Rain (in)	Floating Point
18	Hourly Rain (in)	Floating Point
19	Weather Condition, where: 0 = clear 1 = few clouds 2 = scattered clouds 3 = broken clouds 4 = overcast 5 = drizzle 6 = rain 7 = frozen rain 8 = showers 9 = mist 10 = tornado 11= fog 12 = smoke 13 = hail 14 = haze 15 = ice crystals 16 = sand 17 = snow grains 18 = snow 19 = snow showers 20 = lightning 21 = thundershowers	Integer
20	Channel 1 Temperature (WMR-968/WMR-918, Davis Vantage Pro)	Floating Point
21	Channel 1 Humidity (WMR-968/WMR-918 only)	Floating Point
22	Channel 2 Temperature (WMR-968/WMR-918, Davis Vantage Pro)	Floating Point
23	Channel 2 Humidity (WMR-968/WMR-918, Davis Vantage Pro)	Floating Point
24		Floating Point

Column	Identifier	Prototype
	Vantage Pro)	
25	Channel 3 Humidity (WMR-968/WMR-918, Davis Vantage Pro)	Floating Point
26	Evapotranspiration (Vantage Pro Plus, WeatherHawk) Leaf Wetness (Columbia Weather Systems only)	Floating Point
27	UV Index (Vantage Pro Plus) Battery Voltage (WeatherHawk)	Floating Point
28	Solar Radiation (Vantage Pro Plus, WeatherHawk)	Floating Point
29	Wind Chill (°F)	Floating Point
30	Indoor Heat Index (°F)	Floating Point
31	Outdoor Heat Index (°F)	Floating Point
32	Dew Point (°F)	Floating Point
33	Rain Rate (in/hour)	Floating Point
34	Outdoor Temp Rate (°F/hr)	Floating Point
35	Indoor temp Rate (°F/hr)	Floating Point
36	Barometer Rate (in/hr)	Floating Point
37	Channel 1 Temp Rate (°F/hr)	Floating Point
38	Channel 2 Temp Rate (°F/hr)	Floating Point
39	Channel 3 Temp Rate (°F/hr)	Floating Point
40	Monthly Rain (in)	Floating Point
41	Yearly Rain (in)	Floating Point

Figure 40 – CSV Output File Format.

7.3 Climate Reports

There are two types of climate reports - monthly and yearly.

7.4 Monthly Climate Report

Menu Shortcut: Reports ▶ Monthly Report

The monthly report consists of the following data for each day of the month:

- ✓ **Day**. Each row in the report shows information for a single day. The date for each row appears at the left of the row.
- ✓ **Mean Temp**. The mean temperature for the day. At the bottom, the mean temperature for the month is shown.
- ✓ **High and Time**. The high temperature for the day and the time at which it occurred. At the bottom of the column, the highest temperature recorded during the month and the day on which it occurred is displayed.
- ✓ **Low and Time**. The low temperature for the day and the time at which it occurred. At the bottom of the column, the lowest temperature recorded during the month and the day on which it occurred is displayed.
- ✓ **Heat Deg-Days**. The number of heating degree-days accumulated on each day. At the bottom of the column, the total heating degree-days accumulated during the month is displayed.
- ✓ **Cool Deg-Days**. The number of cooling degree-days accumulated on each day. At the bottom of the column, the total cooling degree-days accumulated during the month is displayed.
- ✓ **Rain**. The rainfall accumulated on each day. At the bottom of the column, the total rainfall accumulated during the month is displayed.
- ✓ **Average Wind Speed**. The average wind speed for the day. At the bottom of the column, the average wind speed for the month is displayed.
- ✓ **High (Wind Speed) and Time**. The high wind speed for the day and the time at which it occurred. At the bottom of the column, the highest wind speed recorded during the month and the day in which it occurred is displayed.
- ✓ **Dom Dir**. The dominant wind direction for the day. At the bottom of the column, the dominant wind direction recorded during the month is displayed.

7.4.1 Modifying the Monthly Climate Report

Menu Shortcut: Settings ▶ Monthly Archive

To modify the monthly climate report, enter the month and year, and modify the stored values.

7.5 Yearly Climate Report

Menu Shortcut: Reports ▶ Yearly Report

The yearly report consists of the following data for each month of the year:

- ✓ **Mon**. Each row in the report shows information for a month day. The month for each row appears at the left of the row.
- ✓ **Mean Temp**. The mean temperature for the month. At the bottom, the mean temperature for the year is shown.
- ✓ **High and Date**. The high temperature for the month and the date at which it occurred. At the bottom of the column, the highest temperature recorded during the year and the day on which it occurred is displayed.
- ✓ **Low and Date**. The low temperature for the month and the date at which it occurred. At the bottom of the column, the lowest temperature recorded during the year and the day on which it occurred is displayed.
- ✓ **Heat Deg-Days**. The number of heating degree-days accumulated for each month. At the bottom of the column, the total heating degree-days accumulated during the year is displayed.
- ✓ **Cool Deg-Days**. The number of cooling degree-days accumulated for each month. At the bottom of the column, the total cooling degree-days accumulated during the year is displayed.
- ✓ **Rain**. The rainfall accumulated for each month. At the bottom of the column, the total rainfall accumulated during the year is displayed.
- ✓ **Average Wind Speed**. The average wind speed for the month. At the bottom of the column, the average wind speed for the year is displayed.
- ✓ **High (Wind Speed) and Date**. The high wind speed for the month and the time at which it occurred. At the bottom of the column, the highest wind speed recorded during the year and the day in which it occurred is displayed.
- ✓ **Dom Dir**. The dominant wind direction for the month. At the bottom of the column, the dominant wind direction recorded during the year is displayed.

7.5.1 Modifying the Yearly Climate Report

Menu Shortcut: Settings ▶ Yearly Archive

To modify the yearly climate report, enter the year, and modify the stored values.

7.6 Climate Report Text File and Printing Climate Reports

A text file is generated once per day for both the monthly and yearly climate report (or whenever the window is opened for viewing). You can print this text file to create a permanent record of this report.

The monthly text file is located at the following location:

- ✓ \VWS\data\noaa\yyyy_mm.txt

where yyyy is the year and mm is the month.

The yearly text file is located at the following location:

- ✓ \VWS\data\noaa\yyyy.txt

where yyyy is the year.

7.7 Globe File Format

Menu Shortcut: Settings ▶ GLOBE Settings

GLOBE is a worldwide hands-on, primary and secondary school-based education and science program sponsored by the United States Government. For more information, please visit www.globe.gov. This program requires you meet the registration requirements set forth by GLOBE. Please contact GLOBE to determine if you qualify.

7.8 Weather Central Format

Menu Shortcut: Settings ▶ Weather Central Settings

Weather Central, Inc., is a complete broadcast weather service. Weather Central has introduced a series of stunning 3D weather graphics and animation systems which have been chosen by such prestigious customers as CBS Morning News, ABC Good Morning America, Televisa, Telemundo Broadcast Group, as well as over 300 U.S. and international television broadcast facilities.

To qualify, you must already own Weather Central broadcast products. For more information about Weather Central, visit www.WeatherCentral.tv.

8 Virtual Weather Station Internet Edition

Virtual Weather Station Internet Edition features Email, FTP File Transfer, and HTTP file transfer. You can automatically send files to an FTP server or automatically send e-mail when alarm conditions occur.

The software automatically converts display panels into jpeg images that any client using a World Wide Web (WWW or Web) browser can access. The software is compatible with standard Web browsers and requires no additional networking software or configuration.

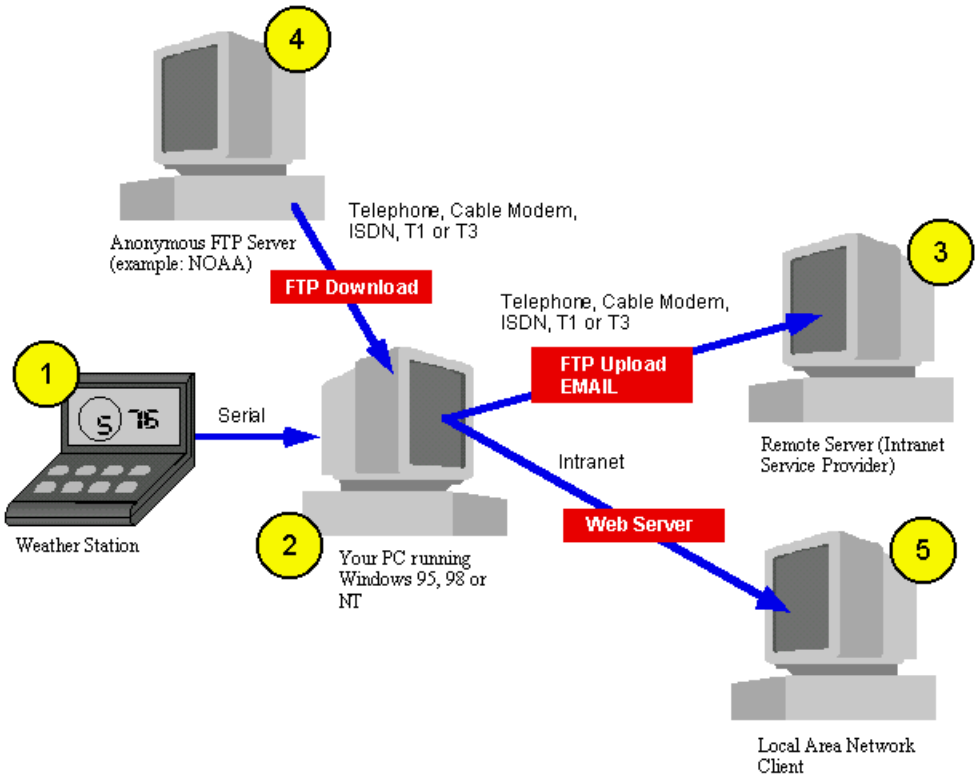


Figure 41- General Description

Referencing the figure above, the weather station (1) communicates to your PC (2) through the serial port. Virtual Weather Station displays graphics on your PC. The graphics are converted to jpeg files for insertion into your web page. Virtual Weather Station uploads these jpeg files and html text files to your remote web server (3) automatically based on a schedule you define. Weather information can also be downloaded from an anonymous ftp server (4) and incorporated into your web page.

METAR data throughout the world can be downloaded and instantly displayed on your local computer.

In addition, VWS will upload data to free weather servers, such as the Weather Underground and Hamweather.

8.1 Weather Website Builder

Menu Shortcut: Internet▶ Weather Website Builder

A weather website can be easily created with the Weather Website Builder. Virtual Weather Station includes pre-defined templates that can be automatically sent to your remote server or your local Intranet.

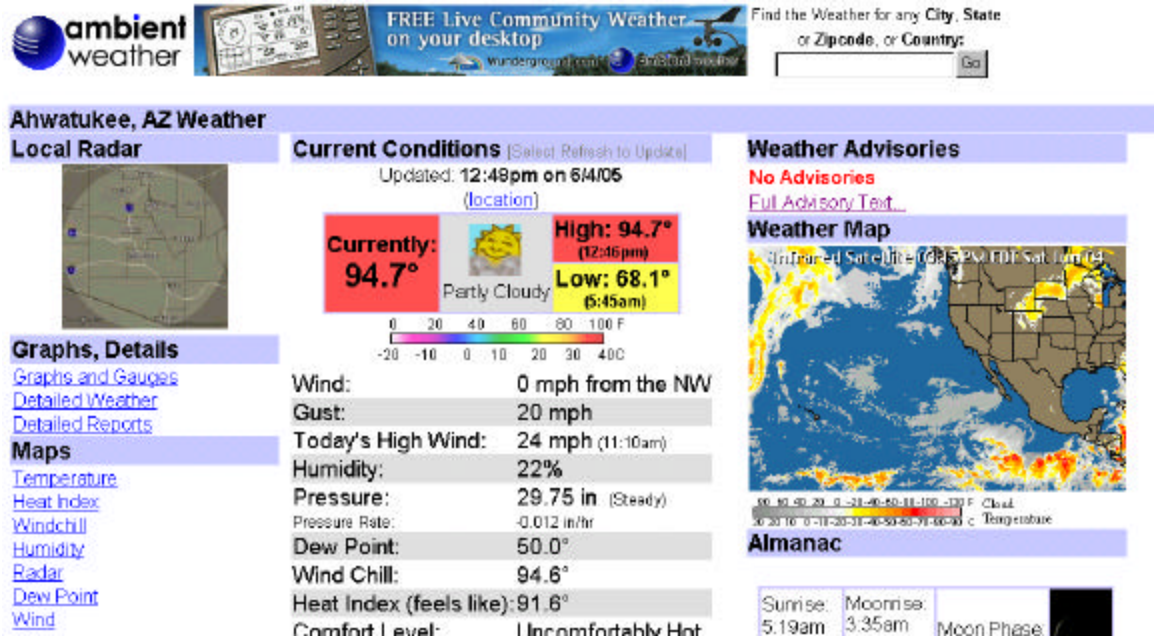


Figure 42 – Webpage example created with the Virtual Weather Station Weather Website Builder.

8.2 Internet Features and Operation

The following section describes methods for displaying your weather data on the Internet or Intranet.

There are two primary ways to operate and display your data using Internet standards and protocols.

Remote Server. Your Web Site is located on a remote server, and you periodically transfer or ftp files. This is the most common application for Virtual Weather Station.

Non Internet Protocols on Local Area Network. Your computer is located on the Intranet, and you simply transfer jpeg files to another location on the network without using ftp or web server options.

The following sections outline settings for your specific application.

8.3 Remote Server Applications

For remote server applications, you will use the automated ftp features.

Virtual Weather Station periodically updates jpeg files, which are snapshots of the gauges and graphs displayed on Virtual Weather Station's panels. These files are linked to an html page resident on your remote server, and periodically transferred automatically.

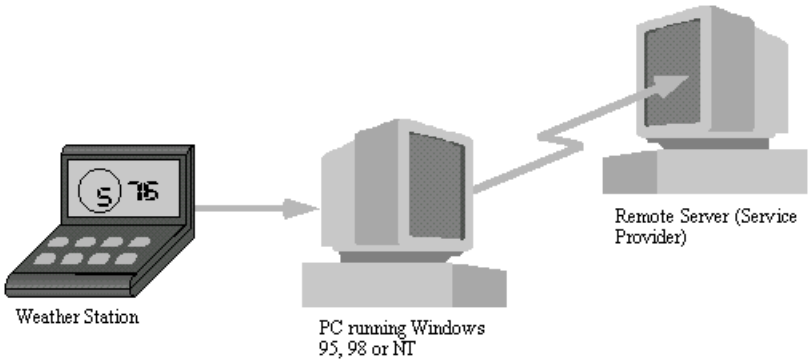


Figure 43- Remote Web Server Configuration

8.4 Connecting to the Internet

Most Internet service providers provide the following features:

A direct connection to the Internet

A remote World Wide Web Server

A remote Ftp Server

A remote E-Mail (SMTP) Server

NOTE: You must have direct access to the Internet for Virtual Weather Station's automated features to work. Connecting through a Service Provider such as America On Line (AOL) will limit Virtual Weather Station's automated features.

8.5 Network Connection

To access the Networking Settings including dial-up networking, select [Settings][Network Connection] from the menubar. Reference Figure 44 - Networking Connection Setup Panel.

There are three primary ways to connect to the Internet:

Never Dial a Connection. Typically used for routers.

Use Default Connection. Connects using the defined default connection to the Internet. Typically used for LAN and Proxy servers.

Use Dial-up Networking. Uses Virtual Weather Station's Remote Access Service (RAS) utilities for Dial-up Networking. Typically used for telephone, DSL or cable modems.

8.6 Dial-up Connection

If you specify Use Dial-up Networking, the following settings are available.

8.6.1 Number of Dial-up Attempts

Defines the number of unsuccessful dial-up attempts per session.

8.6.2 Number of Seconds to Wait Between Attempts

The number of seconds between dial-up attempts. Allows some modems extended time to hang the phone line.

8.6.3 Use the Following Dial-up Networking Connection

Select one of the dial-up networking connections defined in the Windows Dial-up Networking.

8.6.4 Username, Password and Domain

Dial-up networking account information.

8.6.5 Dial-up Automation

Stay Connected after Dial-up. Stays connected to the remote server after dial-up.

Disconnect after Internet Operation Complete. Disconnects from the remote server after all internet operations are complete. Note that if you are already connected to the Internet when the dial-up session is opened, Virtual Weather Station will not disconnect from the remote server.

Menu Shortcut: Internet▶ Network Connection

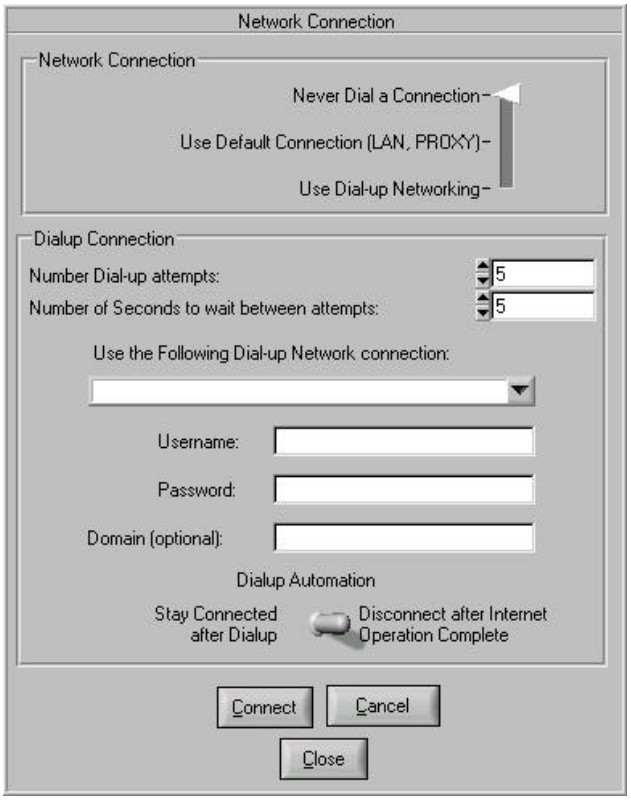


Figure 44 - Networking Connection Setup Panel

8.7 General FTP Settings

The following general FTP Settings allow you to control each FTP session.

8.7.1 FTP Timeout

The timeout period for each FTP operation.

8.7.2 Successive Login Attempts

Number of successive attempts to login to the FTP server.

8.7.3 Maximum Connect Time

The maximum time period to remain connected to the server. This prevents extended connections due to slow internet connections or failed connections.

8.7.4 Time Delay Between Transfers

Some servers can not accept immediate FTP commands. If you commonly receive system socket errors, increase this timer.

8.7.5 Display Connect Timer

Displays the time in seconds that Virtual Weather Station will remain connected to the Internet before timeout.

8.7.6 Max CPU During FTP

To speed up the ftp transfers (which may be important for dial-up applications), VWS resources will automatically increase to the maximum allowable. This feature is particularly useful if FTP transfers timeout.

8.7.7 FTP Priority

Sets the priority of the FTP program. Set this value to High Priority if you are having persistent problems with FTP timeouts.

Menu Shortcut: Internet▶ Network Connection

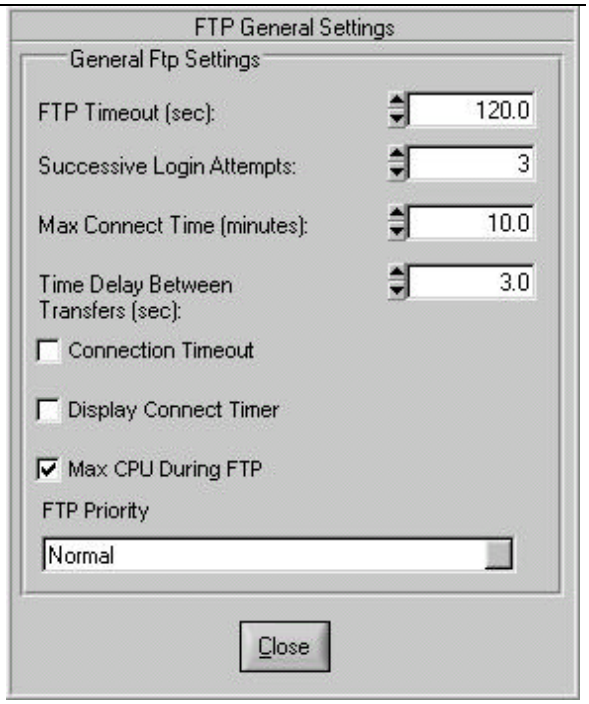


Figure 45 – General FTP Settings

8.8 Virtual Weather Station jpeg Images

When you start Virtual Weather Station for the first time and Virtual Weather Station negotiates communication with your Weather Station, jpeg files are automatically created. The files can be found in c:\vws\root (or the installation directory you specified). The filenames are structured as follows:

vws#.jpg

where # is a unique number designated for a specific gauge, graph or display panel.

The files can be created or updated when you define a display panel.

8.9 Jpeg File Index

The following table provides a complete list of jpg files generated by Virtual Weather Station. Numbers shown are proceeded by vws and followed by .jpg.

For example, the Wind Direction Color Spectrum file is vws001.jpg

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank	Graph2
Wind Direction	001	148	295	442	589	736	883	---	1177	1324	1471	1618	1765
Wind Speed	002	149	---	443	590	737	884	---	1178	1325	1472	1619	1766
Gust	003	150	---	444	591	738	885	---	1179	1326	1473	1620	1767
Indoor Humidity	004	151	---	445	592	739	886	---	1180	1327	1474	1621	1768
Outdoor Humidity	005	152	---	446	593	740	887	---	1181	1328	1475	1622	1769
Indoor Temperature	006	153	---	447	594	741	888	---	1182	1329	1476	1623	1770
Outdoor Temperature	007	154	---	448	595	742	889	---	1183	1330	1477	1624	1771
Barometer	008	155	---	449	596	743	890	---	1184	1331	1478	1625	1772
Total Rain	009	156	---	450	597	744	891	---	1185	1332	1479	1626	1773
Channel 1 Temperature (WMR-968/WMR-918, Davis Vantage Pro)	010	157	---	451	598	745	892	---	1186	1333	1480	1627	1774
Channel 1 Humidity (WMR-968/WMR-918, Davis Vantage Pro)	011	158	---	452	599	746	893	---	1187	1334	1481	1628	1775
Channel 2 Temperature (WMR-968/WMR-918, Davis Vantage Pro)	012	159	---	453	600	747	894	---	1188	1335	1482	1629	1776
Channel 2 Humidity (WMR-968/WMR-918, Davis Vantage Pro)	013	160	---	454	601	748	895	---	1189	1336	1483	1630	1777
Channel 3 Temperature (WMR-968/WMR-918, Davis Vantage Pro)	014	161	---	455	602	749	896	---	1190	1337	1484	1631	1778
Channel 3 Humidity (WMR-968/WMR-918, Davis Vantage Pro)	015	162	---	456	603	750	897	---	1191	1338	1485	1632	1779
Evapotranspiration (Davis, WeatherHawk)	016	163	---	457	604	751	898	---	1192	1339	1486	1633	1780
UV Index (Davis) or Battery Voltage (WeahterHawk)	017	164	---	458	605	752	899	---	1193	1340	1487	1634	1781
Solar Radiation (Davis, WeatherHawk)	018	165	---	459	606	753	900	---	1194	1341	1488	1635	1782

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank	Graph2
Wind Chill	019	166	---	460	607	754	901	---	1195	1342	1489	1636	1783
Heat Index In	020	167	---	461	608	755	902	---	1196	1343	1490	1637	1784
Heat Index Out	021	168	---	462	609	756	903	---	1197	1344	1491	1638	1785
Dewpoint	022	169	---	463	610	757	904	---	1198	1345	1492	1639	1786
Sea-level Barometer	023	170	---	464	611	758	905	---	1199	1346	1493	1640	1787
Altitude Barometer	---	171	---	465	612	759	906	---	1200	1347	1494	1641	1788
Cloud Base	---	172	---	466	613	760	907	---	1201	1348	1495	1642	1789
Air Density	---	173	---	467	614	761	908	---	1202	1349	1496	1643	1790
Virtual Temperature	---	174	---	468	615	762	909	---	1203	1350	1497	1644	1791
Vapor Pressure	---	175	---	469	616	763	910	---	1204	1351	1498	1645	1792
Wind Direction Rate	029	176	---	470	617	764	911	---	1205	1352	1499	1646	1793
Wind Speed Rate	030	177	---	471	618	765	912	---	1206	1353	1500	1647	1794
Gust Rate	031	178	---	472	619	766	913	---	1207	1354	1501	1648	1795
Indoor Humidity Rate	032	179	---	473	620	767	914	---	1208	1355	1502	1649	1796
Outdoor Humidity Rate	033	180	---	474	621	768	915	---	1209	1356	1503	1650	1797
Indoor Temperature Rate	034	181	---	475	622	769	916	---	1210	1357	1504	1651	1798
Outdoor Temperature Rate	035	182	---	476	623	770	917	---	1211	1358	1505	1652	1799
Barometer Rate	036	183	---	477	624	771	918	---	1212	1359	1506	1653	1800
Total Rain Rate	037	184	---	478	625	772	919	---	1213	1360	1507	1654	1801
Channel 1 Temperature Rate (WMR-968/WMR-918, Davis Vantage Pro)	038	185	---	479	626	773	920	---	1214	1361	1508	1655	1802
Channel 1 Humidity Rate (WMR-968/WMR-918, Davis Vantage Pro)	039	186	---	480	627	774	921	---	1215	1362	1509	1656	1803
Channel 2 Temperature Rate (WMR-968/WMR-918, Davis Vantage Pro)	040	187	---	481	628	775	922	---	1216	1363	1510	1657	1804
Channel 2 Humidity Rate (WMR-968/WMR-918, Davis Vantage	041	188	---	482	629	776	923	---	1217	1364	1511	1658	1805

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank	Graph2
968/WMR-918, Davis Vantage Pro)													
Channel 3 Temperature Rate (WMR-968/WMR-918, Davis Vantage Pro)	042	189	---	483	630	777	924	---	1218	1365	1512	1659	1806
Channel 3 Humidity Rate (WMR-968/WMR-918, Davis Vantage Pro)	043	190	---	484	631	778	925	---	1219	1366	1513	1660	1807
Evapotranspiration Rate (Davis, WeatherHawk)	044	191	---	485	632	779	926	---	1220	1367	1514	1661	1808
UV Index Rate (Davis) Battery Voltage Rate (WeatherHawk)	045	192	---	486	633	780	927	---	1221	1368	1515	1662	1809
Solar Radiation Rate (Davis, WeahterHawk)	046	193	---	487	634	781	928	---	1222	1369	1516	1663	1810
Wind Chill Rate	047	194	---	488	635	782	929	---	1223	1370	1517	1664	1811
Heat Index In Rate	048	195	---	489	636	783	930	---	1224	1371	1518	1665	1812
Heat Index Out Rate	049	196	---	490	637	784	931	---	1225	1372	1519	1666	1813
Dewpoint Rate	050	197	---	491	638	785	932	---	1226	1373	1520	1667	1814
Sea-level Barometer Rate	051	198	---	492	639	786	933	---	1227	1374	1521	1668	1815
Wind Direction High	052	199	---	493	640	787	934	---	1228	1375	1522	1669	1816
Wind Speed Average	053	200	---	494	641	788	935	---	1229	1376	1523	1670	1817
Gust Average	054	201	---	495	642	789	936	---	1230	1377	1524	1671	1818
Indoor Humidity Average	055	202	---	496	643	790	937	---	1231	1378	1525	1672	1819
Outdoor Humidity Average	056	203	---	497	644	791	938	---	1232	1379	1526	1673	1820
Indoor Temperature Average	057	204	---	498	645	792	939	---	1233	1380	1527	1674	1821
Outdoor Temperature Average	058	205	---	499	646	793	940	---	1234	1381	1528	1675	1822
Barometer Average	059	206	---	500	647	794	941	---	1235	1382	1529	1676	1823
Total Rain Average	060	207	---	501	648	795	942	---	1236	1383	1530	1677	1824
Channel 1 Temperature Average (WMR-968/WMR-918, Davis	061	208	---	502	649	796	943	---	1237	1384	1531	1678	1825

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank	Graph2
Vantage Pro)													
Channel 1 Humidity Average (WMR-968/WMR-918, Davis Vantage Pro)	063	209	---	503	650	797	944	---	1238	1385	1532	1679	1826
Channel 2 Temperature Average (WMR-968/WMR-91, Davis Vantage Pro 8)	063	210	---	504	651	798	945	---	1239	1386	1533	1680	1827
Channel 2 Humidity Average (WMR-968/WMR-918, Davis Vantage Pro)	064	211	---	505	652	799	946	---	1240	1387	1534	1681	1828
Channel 3 Temperature Average (WMR-968/WMR-918, Davis Vantage Pro)	065	212	---	506	653	800	947	---	1241	1388	1535	1682	1829
Channel 3 Humidity Average (WMR-968/WMR-918, Davis Vantage Pro)	066	213	---	507	654	801	948	---	1242	1389	1536	1683	1830
Evapotranspiration Average (Davis, WeatherHawk)	067	214	---	508	655	802	949	---	1243	1390	1537	1684	1831
UV Index Average (Davis) Battery Voltage (WeatherHawk)	068	215	---	509	656	803	950	---	1244	1391	1538	1685	1832
Solar Radiation Average (Davis, WeatherHawk)	069	216	---	510	657	804	951	---	1245	1392	1539	1686	1833
Wind Chill Average	070	217	---	511	658	805	952	---	1246	1393	1540	1687	1834
Heat Index In Average	071	218	---	512	659	806	953	---	1247	1394	1541	1688	1835
Heat Index Out Average	072	219	---	513	660	807	954	---	1248	1395	1542	1689	1836
Dewpoint Average	073	220	---	514	661	808	955	---	1249	1396	1543	1690	1837
Sea-level Barometer Average	074	221	---	515	662	809	956	---	1250	1397	1544	1691	1838
Wind Direction High	---	---	---	---	---	---	---	---	---	---	---	---	---
Wind Speed High	---	---	---	---	---	---	---	---	---	---	---	---	---
Gust High	---	---	---	---	---	---	---	---	---	---	---	---	---
Indoor Humidity High	---	---	---	---	---	---	---	---	---	---	---	---	---
Outdoor Humidity High	---	---	---	---	---	---	---	---	---	---	---	---	---

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank	Graph2
Indoor Temperature High	---	---	---	---	---	---	---	---	---	---	---	---	---
Outdoor Temperature High	---	---	---	---	---	---	---	---	---	---	---	---	---
Barometer High	---	---	---	---	---	---	---	---	---	---	---	---	---
Total Rain High	---	---	---	---	---	---	---	---	---	---	---	---	---
Channel 1 Temperature High (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	---	---	---	---	---	---	---
Channel 1 Humidity High (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	---	---	---	---	---	---	---
Channel 2 Temperature High (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	---	---	---	---	---	---	---
Channel 2 Humidity High (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	---	---	---	---	---	---	---
Channel 3 Temperature High (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	---	---	---	---	---	---	---
Channel 3 Humidity High (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	---	---	---	---	---	---	---
Evapotranspiration High (Davis, WeatherHawk)	---	---	---	---	---	---	---	---	---	---	---	---	---
UV Index High (Davis) Battery Voltage (WeatherHawk)	---	---	---	---	---	---	---	---	---	---	---	---	---
Solar Radiation High (Davis, WeatherHawk)	---	---	---	---	---	---	---	---	---	---	---	---	---
Wind Chill High	---	---	---	---	---	---	975	---	---	---	---	---	---
Heat Index In High	---	---	---	---	---	---	976	---	---	---	---	---	---
Heat Index Out High	---	---	---	---	---	---	977	---	---	---	---	---	---
Dewpoint High	---	---	---	---	---	---	978	---	---	---	---	---	---
Sea-level Barometer High	---	---	---	---	---	---	979	---	---	---	---	---	---

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank	Graph2
Wind Direction Low	---	---	---	---	---	---	980	---	---	---	---	---	---
Wind Speed Low	---	---	---	---	---	---	981	---	---	---	---	---	---
Gust Low	---	---	---	---	---	---	982	---	---	---	---	---	---
Indoor Humidity Low	---	---	---	---	---	---	983	---	---	---	---	---	---
Outdoor Humidity Low	---	---	---	---	---	---	984	---	---	---	---	---	---
Indoor Temperature Low	---	---	---	---	---	---	985	---	---	---	---	---	---
Outdoor Temperature Low	---	---	---	---	---	---	986	---	---	---	---	---	---
Barometer Low	---	---	---	---	---	---	987	---	---	---	---	---	---
Total Rain Low	---	---	---	---	---	---	988	---	---	---	---	---	---
Channel 1 Temperature Low (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	989	---	---	---	---	---	---
Channel 1 Humidity Low (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	990	---	---	---	---	---	---
Channel 2 Temperature Low (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	991	---	---	---	---	---	---
Channel 2 Humidity Low (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	992	---	---	---	---	---	---
Channel 3 Temperature Low (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	993	---	---	---	---	---	---
Channel 3 Humidity Low (WMR-968/WMR-918, Davis Vantage Pro)	---	---	---	---	---	---	994	---	---	---	---	---	---
Evapotranspiration Low (Davis, WeatherHawk)	---	---	---	---	---	---	995	---	---	---	---	---	---
UV Index Low (Davis) Battery Voltage (WeatherHawk)	---	---	---	---	---	---	996	---	---	---	---	---	---
Solar Radiation Low (Davis, WeatherHawk)	---	---	---	---	---	---	997	---	---	---	---	---	---

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank	Graph2
Wind Chill Low	---	---	---	---	---	---	998	---	---	---	---	---	---
Heat Index In Low	---	---	---	---	---	---	999	---	---	---	---	---	---
Heat Index Out Low	---	---	---	---	---	---	1000	---	---	---	---	---	---
Dewpoint Low	---	---	---	---	---	---	1001	---	---	---	---	---	---
Sea-level Barometer Low	---	---	---	---	---	---	1002	---	---	---	---	---	---
Daily Rain	---	---	---	---	---	---	1003	---	---	---	---	---	---
Hourly Rain	---	---	---	---	---	---	1004	---	---	---	---	---	---
Last 24 Hour Rain	---	---	---	---	---	---	1005	---	---	---	---	---	---
Rain Rate	---	---	---	---	---	---	1006	---	---	---	---	---	---
Wind Run	---	---	---	---	---	---	1007	---	---	---	---	---	---
Degree Days Heating	---	---	---	---	---	---	1008	---	---	---	---	---	---
Degree Days Cooling	---	---	---	---	---	---	1009	---	---	---	---	---	---
Moon Phase	---	---	---	---	---	---	1010	1151	---	---	---	---	---
Monthly Rain	---	---	---	---	---	---	1011	---	---	---	---	---	---
Deg Days Heating Month	---	---	---	---	---	---	1012	---	---	---	---	---	---
Deg Days Cooling Month	---	---	---	---	---	---	1013	---	---	---	---	---	---
Wind Run Month	---	---	---	---	---	---	1014	---	---	---	---	---	---
Deg Days Heating Year	---	---	---	---	---	---	1015	---	---	---	---	---	---
Deg Days Cooling Year	---	---	---	---	---	---	1016	---	---	---	---	---	---
Wind Run Year	---	---	---	---	---	---	1017	---	---	---	---	---	---
Heat Stress	---	---	---	---	---	---	1018	---	---	---	---	---	---
Comfort Level	---	---	---	---	---	---	1019	---	---	---	---	---	---
Forecast	---	---	---	---	---	---	1020	---	---	---	---	---	---
Barom Trend	---	---	---	---	---	---	1021	---	---	---	---	---	---
Pressure Trend	---	---	---	---	---	---	1022	---	---	---	---	---	---
Beaufort Scale	---	---	---	---	---	---	1023	---	---	---	---	---	---

Parameter / Display	Color Spectrum	High/Low	Wind Direction	Thermometer	Gauge	Graph	Alpha Numeric	Moon Phase	Distribution	Strip Chart	Meter	Tank	Graph2
Date	---	---	---	---	---	---	1024	---	---	---	---	---	---
Time	---	---	---	---	---	---	1025	---	---	---	---	---	---
Sunrise	---	---	---	---	---	---	1026	---	---	---	---	---	---
Sunset	---	---	---	---	---	---	1027	---	---	---	---	---	---
Moonrise	---	---	---	---	---	---	1028	---	---	---	---	---	---
Moonset	---	---	---	---	---	---	1029	---	---	---	---	---	---
Windspeed Verbose	Tags Only												

Table 12– Jpg Display Settings File Index Numbers

8.10 Other Jpeg Filenames

In addition to the jpg filenames in the previous section, the following filenames describe other jpg files created from the desktop weather images.

Description	Filename
Broadcast Panel Display	broadcast.jpg
Icon Display	icon.jpg
METAR Icons	icon1.jpg thru icon30.jpg
Cable TV Slide 1	cable1.jpg
Cable TV Slide 2	cable2.jpg

Table 13– Other Jpg Filenames

8.11 Intranet and Local Area Network Applications

If your computer is on a Local Area Network or an Intranet, both the ftp and web server options will work.

Virtual Weather Station provides another method, which is direct jpg file transfer. This does not require use of ftp or web server technology. Select the Jpeg Direct File Transfer option. The files will be transferred to the Jpeg file location specified in the panel.

8.12 Web Page Templates

Your software was shipped with several HTML templates. To view these templates, select Weather Website Builder from the Internet Menu, and select one of the Web Page Templates.

8.13 Creating Web Pages with Virtual Weather Station Tags

NOTE: It is highly recommended you start with the html templates provided with Virtual Weather Station and edit these files to familiarize yourself with this feature. Run the Weather Website Builder provided under the help menu, and then explore the file templates and HTML files generated from the templates.

8.13.1 Description of HTML Tags

HTML Tags allow you to insert weather station data text into your web page. Virtual Weather Station accomplishes this by searching for a known “Tag” in a “Template” file, replacing the tag with weather data, and copying the template to an HTML file. The steps are provided in the following sections.

8.13.2 Creating an HTML Template File (htx file)

HTX files or HTML template files can be created with most Web Page authoring tools. Microsoft Frontpage is one of several commercially available web authoring packages, and there are several shareware software packages available.

To create a template file, save the template with an htx file extension with any text editor or web authoring tool.

8.13.3 Complete List of Tags

Menu Shortcut: Internet▶ HTML Tags

To view the complete list of tags, select the **Complete Tag List** icon located in this window.

8.13.4 Inserting HTML Tags Into the Templates

There are three types of File Tags:

Each weather parameter has a unique file tag. For example, the file tag for the outdoor temperature can be inserted into your web page template as follows:

Outside Temperature: ^vxv006^^uni006^

yields, for example:

Outside Temperature: 72°F

where the vxv006 is the HTML tag for outdoor temperature, uni006 in the units of measure, and ^ is the parsing character.

METAR data that you download has a unique file tag. For example:

Los Angeles International Airport (KLAX) Temperature: ^mtr004KLAX^°F

where the mtr004 is the METAR tag for outdoor temperature, KLAX is the METAR designator for Los Angeles International Airport, and ^ is the parsing character.

File Tags. You can specify the path of any file specified on the File Tags list. For example:

^c:\vws\data\daily.txt^

where c:\vws\data\daily.txt is the complete file path and ^ is the parsing character. For more information for adding a file path to the tag list, reference Section 8.14, HTML File Tags.

To view a complete list of the HTML tags, reference Figure 46 - HTMLTags. The HTML Tags window allows you to easily cut and paste HTML tags into the template file.

To select and copy a Tag to the clipboard, double click on the selected parameter in the list. Next, paste the Tag into your HTML template.

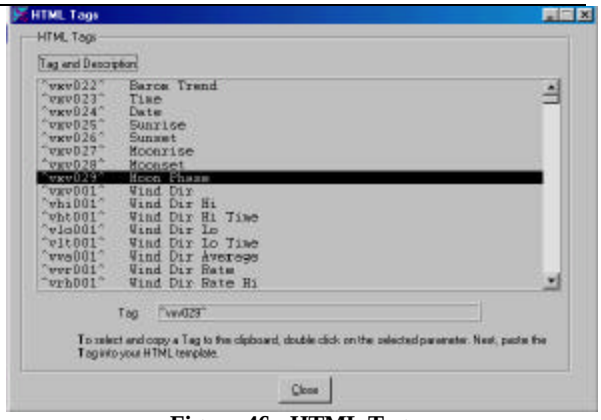


Figure 46 - HTML Tags

The following table provides an index of tag names:

Tag Name	Description
WEATHER STATION DATA	
^**vxv**###^	**vxv** = Virtual Weather value, ### designates weather parameter number. Example: ^vxv006^
^**vhi**###^	**vhi** = Virtual Weather Daily High
^**vht**###^	**vht** = Virtual Weather Daily High Time
^**vlo**###^	**vlo** = Virtual Weather Daily Low
^**vlt**###^	**vlt** = Virtual Weather Daily Low Time
^**vva**###^	**vva** = Virtual Weather Running (filtered) Average Value
^**vda**###^	**vda** = Virtual Weather Daily Average Value
^**vma**###^	**vma** = Virtual Weather Monthly Average Value
^**vya**###^	**vya** = Virtual Weather Yearly Average Value
^**vvr**###^	**vvr** = Virtual Weather Rate
^**vrh**###^	**vrh** = Virtual Weather Rate High
^**vrt**###^	**vrt** = Virtual Weather Rate High Time
^**vrl**###^	**vrl** = Virtual Weather Rate Low
^**vrs**###^	**vrs** = Virtual Weather Rate Low Time

Tag Name	Description
^**vmh**###^	**vmh** = Virtual Weather Monthly High
^**vmd**###^	**vmd** = Virtual Weather Monthly High Date
^**vml**###^	**vml** = Virtual Weather Monthly Low
^**vme**###^	**vme** = Virtual Weather Monthly Low Date
^**vyh**###^	**vyh** = Virtual Weather Yearly High
^**vyd**###^	**vyd** = Virtual Weather Yearly High Date
^**vyl**###^	**vyl** = Virtual Weather Yearly Low
^**vye**###^	**vye** = Virtual Weather Yearly Low Date
^**vzh**###^	**vzh** = Virtual Weather Yesterday's High
^**vzt**###^	**vzt** = Virtual Weather Yesterday's High Time
^ **vzl**###^	**vzl** = Virtual Weather Yesterday's Low
^ **vzs**###^	**vzs** = Virtual Weather Yesterday's Low Time
^ **vhv**###^	**vhv** = Virtual Weather value, 24 hours ago
^ **vdv**###^	**vdv** = Virtual Weather value, difference between current value and value 24 hours ago, or daily difference.
^ **uni**###^	**uni** = Abbreviated units of measure for the Virtual Weather station value.
^temp_rec_hi#^	**temp_rec_hi –** Record high daily temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: bgcolor="#^temp_rec_hi1^"> where temp_rec_hi1 is the record high temperature for station 1 defined in the almanac.
^temp_rec_lo#^	**temp_rec_lo –** Record low daily temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: bgcolor="#^temp_rec_lo1^"> where temp_rec_lo1 is the record low temperature for station 1 defined in the almanac.
^temp_norm_hi#^	**temp_norm_hi –** Normal high daily temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: bgcolor="#^temp_norm_hi1^"> where temp_norm_hi1 is the record normal temperature for station 1 defined in the almanac.
^temp_norm_lo#^	**temp_norm_lo –** Normal low daily temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: bgcolor="#^temp_norm_lo1^"> where temp_norm_lo1 is the normal low temperature for station 1 defined in the almanac.
METAR DATA	
^mtr001ABCD^	**ABCD** = METAR identifier, 001 specifies the `METAR Identifier`. Example: ^mtrKLAX001^
^mtr002ABCD^	**ABCD** = METAR identifier, 002 specifies the `METAR Site`. Example: ^mtrKLAX002^
^mtr003ABCD^	**ABCD** = METAR identifier, 003specifies the `METAR UTC Update`. Example: ^mtrKLAX003^
^mtr004ABCD^	**ABCD** = METAR identifier, 004 specifies the `METAR`

Tag Name	Description
	Temperature. Example: ^mtrKLAX005^
^mtr005ABCD^	**ABCD** = METAR identifier, 005 specifies the METAR Dew Point. Example: ^mtrKLAX005^
^mtr006ABCD^	**ABCD** = METAR identifier, 006 specifies the METAR % Relative Humidity. Example: ^mtrKLAX006^
^mtr007ABCD^	**ABCD** = METAR identifier, 007 specifies the METAR Pressure. Example: ^mtrKLAX007^
^mtr008ABCD^	**ABCD** = METAR identifier, 008 specifies the METAR Wind Direction. Example: ^mtrKLAX008^
^mtr009ABCD^	**ABCD** = METAR identifier, 009 specifies the METAR Wind Speed. Example: ^mtrKLAX001^
^mtr010ABCD^	**ABCD** = METAR identifier, 010 specifies the METAR Wind Gust. Example: ^mtrKLAX010^
^mtr011ABCD^	**ABCD** = METAR identifier, 011 specifies the METAR Visibility. Example: ^mtrKLAX011^
^mtr012ABCD^	**ABCD** = METAR identifier, 012 specifies the METAR Cloud Height. Example: ^mtrKLAX012^
^mtr013ABCD^	**ABCD** = METAR identifier, 013 specifies the METAR Sky. Example: ^mtrKLAX013^
^mtr014ABCD^	**ABCD** = METAR identifier, 014 specifies the METAR Weather.

Tag Name	Description
^mtr005ABCD^	**ABCD** = METAR identifier, 005 specifies the METAR Dew Point. Example: ^mtrKLAX005^
^mtr006ABCD^	**ABCD** = METAR identifier, 006 specifies the METAR % Relative Humidity. Example: ^mtrKLAX006^
^mtr007ABCD^	**ABCD** = METAR identifier, 007 specifies the METAR Pressure. Example: ^mtrKLAX007^
^mtr008ABCD^	**ABCD** = METAR identifier, 008 specifies the METAR Wind Direction. Example: ^mtrKLAX008^
^mtr009ABCD^	**ABCD** = METAR identifier, 009 specifies the METAR Wind Speed. Example: ^mtrKLAX001^
^mtr010ABCD^	**ABCD** = METAR identifier, 010 specifies the METAR Wind Gust. Example: ^mtrKLAX010^
^mtr011ABCD^	**ABCD** = METAR identifier, 011 specifies the METAR Visibility. Example: ^mtrKLAX011^
^mtr012ABCD^	**ABCD** = METAR identifier, 012 specifies the METAR Cloud Height. Example: ^mtrKLAX012^
^mtr013ABCD^	**ABCD** = METAR identifier, 013 specifies the METAR Sky. Example: ^mtrKLAX013^
^mtr014ABCD^	

Tag Name	Description
	Example: ^mtrKLAX014^
^mtr015ABCD^	**ABCD** = METAR identifier, 015 specifies the `METAR Rain/hr`. Example: ^mtrKLAX015^
^mtr016ABCD^	**ABCD** = METAR identifier, 016 specifies the `METAR Wind Chill`. Example: ^mtrKLAX016^
^mtr017ABCD^	**ABCD** = METAR identifier, 017 specifies the `METAR Heat Index`. Example: ^mtrKLAX017^
WARNING DATA	
warning_desc#	**warning_desc** = Weather Warning Description # = location (1 to 15)
warning_time#	**warning_time** =Weather Warning Time # = location (1 to 15)
ALMANAC (CLIMATE) DATA	
^almhi#^	**almhi -** Almanac record high # = location (1 to 15)
^almdatehi#^	**almdatehi -** Almanac record high date # = location (1 to 15)
^almlo#^	**almlo -** Almanac record low # = location (1 to 15)
^almdatelo#^	**almdatelo -** Almanac record low date # = location (1 to 15)
^almnormhi#^	**almnormhi -** Almanac normal high # = location (1 to 15)
^almnormlo#^	**almnormlo -** Almanac normal low # = location (1 to 15)
^almytd#^	**almvtd** - Almanac normal year-to-date precipitation

Tag Name	Description
^mtr015ABCD^	**ABCD** = METAR identifier, 015 specifies the `METAR Rain/hr`. Example: ^mtrKLAX015^
^mtr016ABCD^	**ABCD** = METAR identifier, 016 specifies the `METAR Wind Chill`. Example: ^mtrKLAX016^
^mtr017ABCD^	**ABCD** = METAR identifier, 017 specifies the `METAR Heat Index`. Example: ^mtrKLAX017^
WARNING DATA	
warning_desc#	**warning_desc** = Weather Warning Description # = location (1 to 15)
warning_time#	**warning_time** =Weather Warning Time # = location (1 to 15)
ALMANAC (CLIMATE) DATA	
^almhi#^	**almhi -** Almanac record high # = location (1 to 15)
^almdatehi#^	**almdatehi -** Almanac record high date # = location (1 to 15)
^almlo#^	**almlo -** Almanac record low # = location (1 to 15)
^almdatelo#^	**almdatelo -** Almanac record low date # = location (1 to 15)
^almnormhi#^	**almnormhi -** Almanac normal high # = location (1 to 15)
^almnormlo#^	**almnormlo -** Almanac normal low # = location (1 to 15)
^almytd#^	

Tag Name	Description
	# = location (1 to 15)
^almmtd#^	**almmtd** - Almanac normal month-to-date precipitation # = location (1 to 15)
^climate_cconds #^	**climate_cconds** - Current weather conditions # = location (1 to 15)
^climate_icon#^	**climate_icon** – Current weather conditions chancetstorms = Chance Thunder storms chanceflurries = Chance Flurries chancerain = Chance Rain chancesleat = Chance Sleat clear = Clear cloudy = Cloudy fog = Fog flurries = Flurries hazy = Hazy mostlycloudy = Mostly Cloudy mostlysunny = Mostly Sunny partlycloudy = Partly Cloudy partlysunny = Partly Sunny rain = Rain sleat = Sleat snow = Snow sunny = Sunny thunderstorms = Thunderstorms unknown = Unknown # = location (1 to 15) Example: http://icons.wunderground.com/graphics/conds/^climate_icon1^.GIF Sunny conditions, station #1: http://icons.wunderground.com/graphics/conds/clear.GIF
^climate_city#^	climate_city - Almanac city name # = location (1 to 15)
^climate_state#^	climate_state - Almanac state name # = location (1 to 15)
MESONET DATA	
meso_sta#	meso_sta – Mesonet Station ID

Tag Name	Description
^almmtd#^	**almmtd** - Almanac normal month-to-date precipitation # = location (1 to 15)
^climate_cconds #^	**climate_cconds** - Current weather conditions # = location (1 to 15)
^climate_icon#^	**climate_icon** – Current weather conditions chancetstorms = Chance Thunder storms chanceflurries = Chance Flurries chancerain = Chance Rain chancesleat = Chance Sleat clear = Clear cloudy = Cloudy fog = Fog flurries = Flurries hazy = Hazy mostlycloudy = Mostly Cloudy mostlysunny = Mostly Sunny partlycloudy = Partly Cloudy partlysunny = Partly Sunny rain = Rain sleat = Sleat snow = Snow sunny = Sunny thunderstorms = Thunderstorms unknown = Unknown # = location (1 to 15) Example: http://icons.wunderground.com/graphics/conds/^climate_icon1^.GIF Sunny conditions, station #1: http://icons.wunderground.com/graphics/conds/clear.GIF
^climate_city#^	climate_city - Almanac city name # = location (1 to 15)
^climate_state#^	climate_state - Almanac state name # = location (1 to 15)
MESONET DATA	
meso_sta#	

Tag Name	Description
	# = station number (1 to 30)
meso_loc#	meso_loc – Mesonet Station ID # = station number (1 to 30)
meso_neigh#	meso_neigh – Mesonet Neighborhood # = station number (1 to 30)
meso_url#	meso_url – Mesonet URL link to weather website # = station number (1 to 30)
meso_URLtext#	meso_URLtext – Mesonet URL link text to weather website # = station number (1 to 30)
meso_historyURL#	meso_historyURL – Mesonet URL to history data on Weather Underground Website # = station number (1 to 30)
meso_lon#	meso_lon – Mesonet Station longitude # = station number (1 to 30)
meso_lat#	meso_lat – Mesonet Station latitude # = station number (1 to 30)
meso_time#	meso_time – Mesonet Station date and time # = station number (1 to 30)
meso_temp#	meso_temp – Mesonet Station ID # = station number (1 to 30)
meso_dew#	meso_dew – Mesonet Station ID # = station number (1 to 30)
meso_rh#	meso_rh – Mesonet Station ID # = station number (1 to 30)
meso_dir#	meso_dir – Mesonet Station ID # = station number (1 to 30)
meso_wspeed#	meso_wspeed – Mesonet Station ID # = station number (1 to 30)
meso_gust#	meso_loc – Mesonet Station ID

Tag Name	Description
meso_loc#	meso_loc – Mesonet Station ID # = station number (1 to 30)
meso_neigh#	meso_neigh – Mesonet Neighborhood # = station number (1 to 30)
meso_url#	meso_url – Mesonet URL link to weather website # = station number (1 to 30)
meso_URLtext#	meso_URLtext – Mesonet URL link text to weather website # = station number (1 to 30)
meso_historyURL#	meso_historyURL – Mesonet URL to history data on Weather Underground Website # = station number (1 to 30)
meso_lon#	meso_lon – Mesonet Station longitude # = station number (1 to 30)
meso_lat#	meso_lat – Mesonet Station latitude # = station number (1 to 30)
meso_time#	meso_time – Mesonet Station date and time # = station number (1 to 30)
meso_temp#	meso_temp – Mesonet Station ID # = station number (1 to 30)
meso_dew#	meso_dew – Mesonet Station ID # = station number (1 to 30)
meso_rh#	meso_rh – Mesonet Station ID # = station number (1 to 30)
meso_dir#	meso_dir – Mesonet Station ID # = station number (1 to 30)
meso_wspeed#	meso_wspeed – Mesonet Station ID # = station number (1 to 30)
meso_gust#	

Tag Name	Description
	# = station number (1 to 30)
meso_barom#	meso_loc – Mesonet Station ID # = station number (1 to 30)
meso_rrate#	meso_loc – Mesonet Station ID # = station number (1 to 30)
MISC. DATA	
^all_gauges^	Displays all of the Virtual Weather Station gauges displayed on your desktop with a space between each gauge.
^all_graphs^	Displays all of the Virtual Weather Station graphs and strip charts displayed on your desktop with a space between each gauge.
^all_icons^	Displays all of the Virtual Weather Station icons displayed on your desktop with a space between each icon.
^default_dir^	Default drive location for Virtual Weather Station. ^default_dir\data\noaa\noaayr.txt^
^vervws^	Virtual Weather Station Version Number
^wstation^	Type of weather station (example, Davis Vantage Pro)
^wsdescription^	Description of the weather station location as defined in Section 6.7.1.
^wslocation^	Location of weather station as defined in Section 6.7.2.
^wstaturl^	URL to Ambient Weather site that describes the weather station type. Used as a hyperlink for ^wstation^
^wslong^	Station location longitude, as defined in Section 6.7.4.
^wslat^	Station location latitude, as defined in Section 6.7.4.
^world_id^	World location identification, used for linking weather maps to the Wunderground, as defined in Section 6.7.3, as follows:

Tag Name	Description
meso_barom#	meso_loc – Mesonet Station ID # = station number (1 to 30)
meso_rrate#	meso_loc – Mesonet Station ID # = station number (1 to 30)
MISC. DATA	
^all_gauges^	Displays all of the Virtual Weather Station gauges displayed on your desktop with a space between each gauge.
^all_graphs^	Displays all of the Virtual Weather Station graphs and strip charts displayed on your desktop with a space between each gauge.
^all_icons^	Displays all of the Virtual Weather Station icons displayed on your desktop with a space between each icon.
^default_dir^	Default drive location for Virtual Weather Station. ^default_dir\data\noaa\noaayr.txt^
^vervws^	Virtual Weather Station Version Number
^wstation^	Type of weather station (example, Davis Vantage Pro)
^wsdescription^	Description of the weather station location as defined in Section 6.7.1.
^wslocation^	Location of weather station as defined in Section 6.7.2.
^wstaturl^	URL to Ambient Weather site that describes the weather station type. Used as a hyperlink for ^wstation^
^wslong^	Station location longitude, as defined in Section 6.7.4.
^wslat^	Station location latitude, as defined in Section 6.7.4.
^world_id^	

Tag Name	Description
	pa = Pacific Ocean, USA, Mexico and Central America at = Atlantic Ocean, USA, Central America us = USA Lower 48 nw = Northwest USA sw = Southwest USA mw = Midwest USA sp = Southcentral USA ne = Northeast USA se = Southeast USA ak = Alaska hi = Hawaii pr = Puerto Rico cn = Canada ca = Mexico and Central America sa = South America gl = Greenland eu = Europe as = Asia a2 = Southeast Asia af = Africa au = Australia and New Zealand Example: http://maps.wunderground.com/data/640x480/^world_id^_ir_anim.gif
^temp_color^	Current temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: `bgcolor="#^temp_color^"`
^temp_color_hi^	High daily temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: `bgcolor="#^temp_color_hi^"`
^temp_color_lo^	Low daily temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: bgcolor="#^temp_color_lo^"
5-DAY FORECAST DATA	
forecast_nexrad#	5-Day Forecast NEXRAD ID for use with Wunderground nexrad graphics.

Tag Name	Description
^temp_color^	Current temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: `bgcolor="#^temp_color^"`
^temp_color_hi^	High daily temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: `bgcolor="#^temp_color_hi^"`
^temp_color_lo^	Low daily temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: bgcolor="#^temp_color_lo^"
5-DAY FORECAST DATA	
forecast_nexrad#	

Tag Name	Description
	# = station number (1 to 4)
forecast_country #	5-Day Forecast country ID for use with Wunderground graphics. # = station number (1 to 4)
forecast_radregion#	5-Day Forecast radar region ID for use with Wunderground radar regional graphics. # = station number (1 to 4)
forecast_tzname #	5-Day Forecast time zone ID. # = station number (1 to 4)
forecast_wmo#	5-Day Forecast 5-digit World Meteorological Organization (WMO) for International stations. # = station number (1 to 4)
forecast_dayx_#	5-Day Forecast day name (example “Tuesday”). x = 5-day forecast day (1 to 5) # = station number (1 to 4)
forecast_hix_#	5-Day Forecast daily high temperature. x = 5-day forecast day (1 to 5) # = station number (1 to 4)
forecast_lox_#	5-Day Forecast daily low temperature. x = 5-day forecast day (1 to 5) # = station number (1 to 4)
forecast_condsx_#	5-Day Forecast conditions. x = 5-day forecast day (1 to 5) # = station number (1 to 4) Examples: Chance Thunder storms Chance Flurries Chance Rain Chance Sleat Clear Cloudy Fog Flurries Hazy

Tag Name	Description
forecast_country #	5-Day Forecast country ID for use with Wunderground graphics. # = station number (1 to 4)
forecast_radregion#	5-Day Forecast radar region ID for use with Wunderground radar regional graphics. # = station number (1 to 4)
forecast_tzname #	5-Day Forecast time zone ID. # = station number (1 to 4)
forecast_wmo#	5-Day Forecast 5-digit World Meteorological Organization (WMO) for International stations. # = station number (1 to 4)
forecast_dayx_#	5-Day Forecast day name (example “Tuesday”). x = 5-day forecast day (1 to 5) # = station number (1 to 4)
forecast_hix_#	5-Day Forecast daily high temperature. x = 5-day forecast day (1 to 5) # = station number (1 to 4)
forecast_lox_#	5-Day Forecast daily low temperature. x = 5-day forecast day (1 to 5) # = station number (1 to 4)
forecast_condsx_#	

Tag Name	Description
	Mostly Cloudy Mostly Sunny Partly Cloudy Partly Sunny Rain Sleat Snow Sunny Thunderstorms Unknown
forecast_iconx_#	**forecast_icon** – 5-Day forecast icon name chancetstorms = Chance Thunder storms chanceflurries = Chance Flurries chancerain = Chance Rain chancesleat = Chance Sleat clear = Clear cloudy = Cloudy fog = Fog flurries = Flurries hazy = Hazy mostlycloudy = Mostly Cloudy mostlysunny = Mostly Sunny partlycloudy = Partly Cloudy partlysunny = Partly Sunny rain = Rain sleat = Sleat snow = Snow sunny = Sunny thunderstorms = Thunderstorms unknown = Unknown x = 5-day forecast day (1 to 5) # = location (1 to 4) Example: http://icons.wunderground.com/graphics/conds/^forecast_icon1^.GIF Sunny conditions, station #1: http://icons.wunderground.com/graphics/conds/clear.GIF
temp_for_hix_#	High daily forecast temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: `bgcolor="#^ temp_for_hi^"` x = 5-day forecast day (1 to 5) # = location (1 to 4)
temp_for_lox_	Low daily forecast temperature

Tag Name	Description
forecast_iconx_#	**forecast_icon** – 5-Day forecast icon name chancetstorms = Chance Thunder storms chanceflurries = Chance Flurries chancerain = Chance Rain chancesleat = Chance Sleat clear = Clear cloudy = Cloudy fog = Fog flurries = Flurries hazy = Hazy mostlycloudy = Mostly Cloudy mostlysunny = Mostly Sunny partlycloudy = Partly Cloudy partlysunny = Partly Sunny rain = Rain sleat = Sleat snow = Snow sunny = Sunny thunderstorms = Thunderstorms unknown = Unknown x = 5-day forecast day (1 to 5) # = location (1 to 4) Example: http://icons.wunderground.com/graphics/conds/^forecast_icon1^.GIF Sunny conditions, station #1: http://icons.wunderground.com/graphics/conds/clear.GIF
temp_for_hix_#	High daily forecast temperature background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: `bgcolor="#^ temp_for_hi^"` x = 5-day forecast day (1 to 5) # = location (1 to 4)
temp_for_lox_	

Tag Name	Description
	background color, based on Figure 47 - Color spectrum for the HTML Tags. Example HTML usage: bgcolor="#^ temp_for_lo^" x = 5-day forecast day (1 to 5) # = location (1 to 4)

Table 14 – Index of HTML Tag Names

Reference Figure 48: Example HTML Template with is an example of an HTML template with HTML Tags inserted.

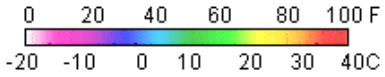


Figure 47 - Color spectrum for the HTML Tags.

Detailed Weather Conditions

Virtual Weather Station Version ^vervws^

Current Conditions

Last Updated: ^vst143^ on ^vst142^
Outside Temperature: ^vxv007^°F
Today's High: ^vhi007^°F at ^vht007^
Lo: ^vlo007^°F at ^vlt007^
Barometric Trend: ^vvr008^

Sunrise : ^vst144^ Sunset: ^vst145^

Moonrise: ^vst146^ Moonset: ^vst147^

Moon Phase: ^vxv128^

Figure 48: Example HTML Template with HTML Tags

8.13.5 Creating the HTML File from the HTML Template (htx) File

Reference Figure 49 - Creating Web Pages with Virtual Weather Station Tags.

To view HTML settings, select **[Internet][HTML Settings]** from the taskbar. This panel specifies the template file location and the Web Page or HTML Filename. The following settings are available:

- ✓ **Update HTML Timer**. Specifies how often to update the HTML panels.
- ✓ **On**. Activates the parsing and saving of the html file
- ✓ **Template File**. HTML template file (htx) contains the HTML tags
- ✓ **HTML Filename** . File created by the template file.
- ✓ **Browse**. Browse to the location of the file(s)
- ✓ **Preview**. Previews the Web Page in your default browser.

To create the "finished" HTML file from the template,

- ✓ Select one of the check boxes **ON**
- ✓ **Browse** to the template file you created (left column of files)
- ✓ **Browse** to define the final location of the HTML file (right column of files)
- ✓ Select the **UPDATE** button
- ✓ Select the **Preview** Button to view the finished HTML file
- ✓ To automatically update this process, select an **HTML File Update Timer**.
- ✓ To upload the finished file to the Internet, select the **Upload Files to Internet** button and Browse to the HTML file location created.

Menu Shortcut: Internet▶ HTML Settings

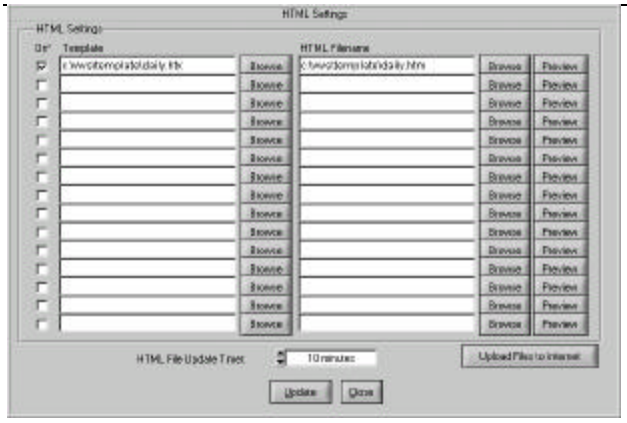


Figure 49 - Creating Web Pages with Virtual Weather Station Tags

8.14 HTML File Tags

File tags can be inserted into the HTML template (htx) to display data from a text file directly in your web page.

Simply specify the filename in the template, including the full file path, as shown below:

^c:\vws\data\daily.txt^

This tag can be directly cut and paste into your web page, and the entire file is displayed in the same font size, color and format.

Files can be downloaded from the Internet, and then displayed in your web pages. This is particularly useful for displaying forecasts and climate data generated by the NOAA and available on the NOAA weather server.

8.15 Ftp Operation

The File Transfer Protocol (FTP) is part of the TCP/IP protocols for data transmission on the Internet and is used mainly to transfer files between computers. FTP is a client-server protocol in which an FTP server waits for FTP clients to connect to the server and issue requests.

Generally, FTP servers require clients to provide a username and password before processing any requests. An FTP server administrator determines the user access policy for the server. Many FTP servers allow anonymous access, with restrictions, to the server. To log onto an FTP server anonymously, clients enter anonymous as the username and their e-mail address as the password.

Virtual Weather Station provides FTP Client functions that connect to, and perform operations on, a specified FTP server. Virtual Weather Station does not provide functions that let your program behave as an FTP server. When your program calls the FTP Client functions, it connects to an FTP server which typically is running on a remote computer.

8.15.1 Connecting to Your Remote Ftp Server

Verify you can connect to your Ftp Server. Select **[Internet][Login]** from the menubar.

Menu Shortcut: Internet▶ FTP Login

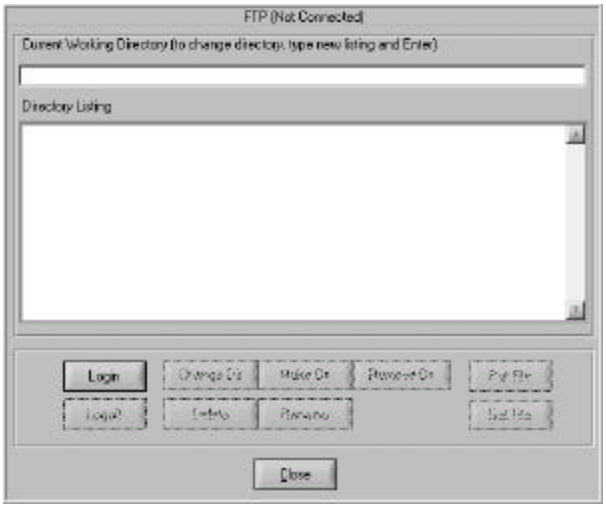


Figure 50 - Ftp Sever Panel

Enter the following information:

- ✓ Server Name (for example, ftp-www.earthlink.net)
- ✓ User Name
- ✓ Password
- ✓ Select [OK].

The initial directory is optional.

Menu Shortcut: Internet▶ FTP Login [Login]

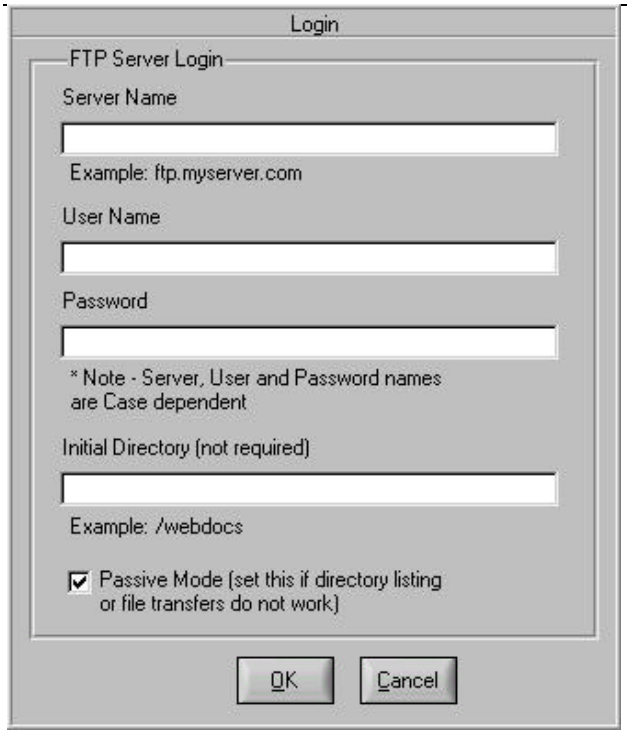


Figure 51 - Ftp Login Panel

This information will be permanently saved for automatically transferring files from your PC to your Web Server.

You should now see your default working directory (for example, \webdocs) and associated files.

You can now ftp the html template files provided with this software to your remote server. You must also transfer the associated jpg files to the remote server. Now is a good time to use the automated FTP features to transfer the jpg files.

If you are not able to see the directory listing, select the passive mode. Some servers operate in the passive mode and do not require commands for listing directories.

Close the Ftp Server Panel.

8.15.2 Automatic Ftp Features

Virtual Weather Station allows you to automatically transfer files from your PC to the Internet and from the Internet to your PC. There are three categories of FTP operation described in the following sections.

8.15.2.1 Sending Jpeg Files Displayed in Virtual Weather Station Desktop to the Internet (Jpeg FTP Settings)

For each element on your desktop, a jpeg image is generated. The files are sent to the created and sent to the Internet at the same time based on a schedule.

Reference Figure 52 - Jpeg FTP Settings. The following sections describe the jpeg FTP settings.

8.15.2.1.1 Creating Temporary Jpg Files First On the Server

Broken links can occur if a web surfer views your web page while a file is in the process of uploading. To avoid these broken links, select the **Create Temporary File First on the Server**. This option creates a file tempfilename.jpg, and then copies tempfilename.jpg to filename.jpg. The process of renaming a file on the server takes much less time than transferring the file to your server, avoiding the broken links.

8.15.2.1.2 Send Files to this Location on Server

Browse to your server location to specify the location the jpeg files will be sent.

Menu Shortcut: Internet▶ Jpeg FTP Settings

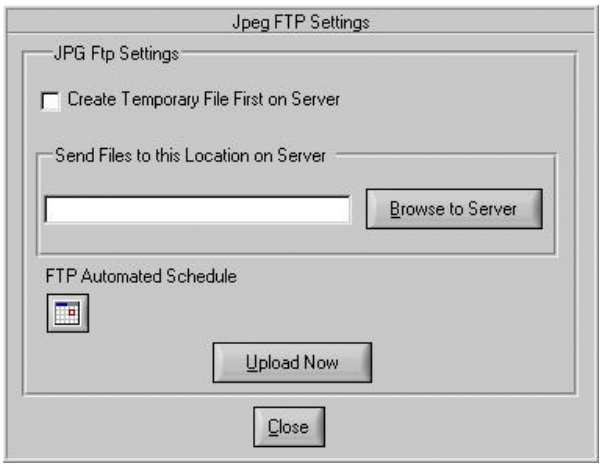


Figure 52 - Jpeg FTP Settings

8.15.2.2 Sending (Upload) User Selectable Files to the Internet (FTP Server)

Virtual Weather Station allows you to send up to 20 files to your remote Ftp server automatically. You can send any file, such as weather cam images or HTML files generated from the HTML templates.

Reference Figure 53 - Sending Files to the Internet (FTP

server).

Menu Shortcut: Internet▶ FTP Upload File (Send)

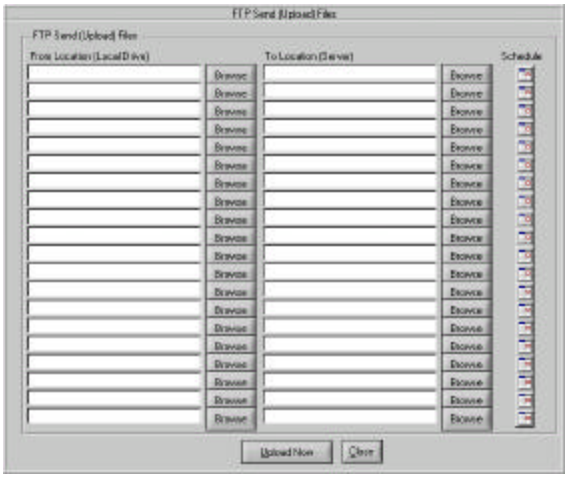


Figure 53 - Sending Files to the Internet (FTP server)

8.15.2.3 Sending (Upload) the Entire Contents of a Folder to the Internet (FTP Server)

Menu Shortcut: Internet▶ FTP Upload Folder (Send)

Virtual Weather Station allows you to send all the files in a specific folder to a specific location on your FTP server.

Reference Figure 54 – Send the Entire Contents of a Folder to the Internet..

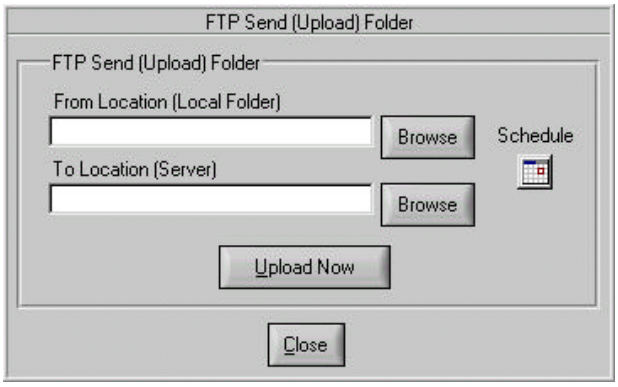


Figure 54 – Send the Entire Contents of a Folder to the Internet

8.15.2.4 Retrieve (Download) Files from the Internet

Menu Shortcut: Internet▶ FTP File Receive (Download)

Files can be automatically downloaded from the Internet based on a schedule. The files include any public file addressable from the Internet, and must be in text format only.

The files are saved on your local drive and can be used for display in your web pages using file tags (see the section on File Tags for more details).

FTP (ftp://) or HTTP (http://) files can be downloaded.

For more information on obtaining National Weather Service text data, please visit http://weather.noaa.gov/pub/data

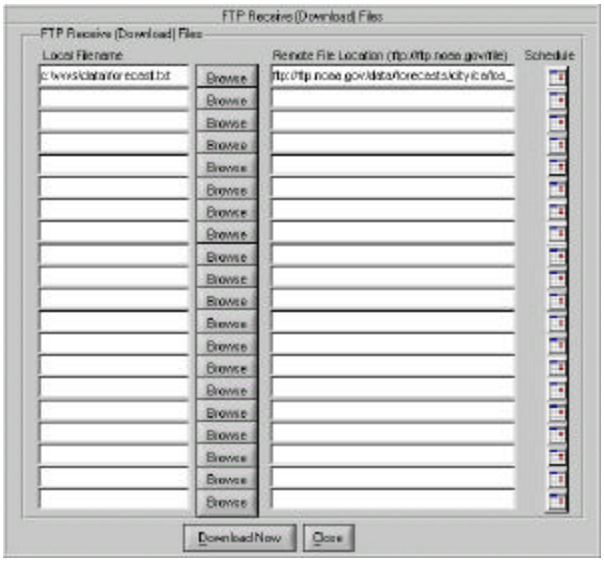


Figure 55 - Downloading Files from the Internet

8.16 E Mail Weather Reports and Alarming

Virtual Weather Station allows you to automatically or manually send Internet e-mail messages. Your Web server must send the message through a server that supports the Simple Mail Transfer Protocol (SMTP) protocol. SMTP is the standard Internet mail transfer protocol. Ask your network administrator for the name of a computer that your server can use as an SMTP server.

The parameters specify the SMTP server, sender, recipient, subject, message body, and file attachments of the message. The file attachments can include any text or binary files. The SMTP standard does not require a user name and password.

To get started, identify your E Mail server name (for example, mail.earthlink.net), and send an alarm to yourself.

8.16.1 Email Settings

Menu Shortcut: Internet▶ Email Settings

Virtual Weather Station allows you to send E Mail

messages and attachments when alarm limits are exceeded. You can also send periodic weather reports. To view the E Mail settings, select [Settings][Email] from the menubar.

Enter the following information:

E-Mail (SMTP) Server. This is the name of the server established by your network administrator. An example SMTP server is mail.earthlink.net.

To: Recipient of your E Mail message. An example is support@AmbientWeather.com. Separate Email addresses by semicolons. For example, if you are addressing the Email message to two addresses (example):

- ✓ support@AmbientWeather.com;support@ambientsw.com
- ✓ From: Sender of E Mail message.
- ✓ Title: Title of the E Mail message.
- ✓ Text Message. If you want to include an optional text message, enter the message in the text box.
- ✓ Attachments. Send attached weather data files.

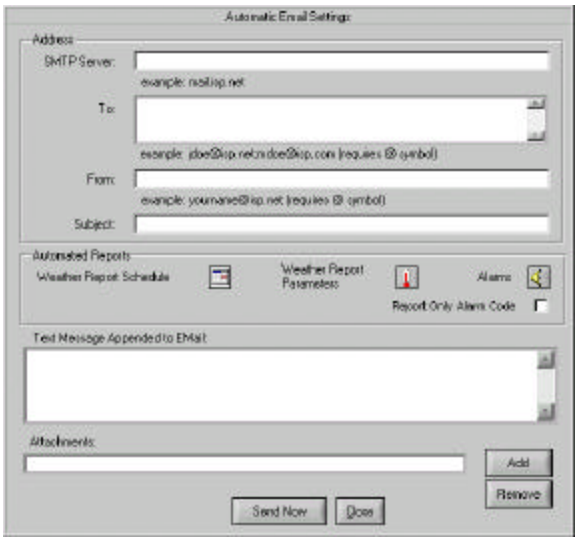


Figure 56: Automatic E Mail Settings

8.16.2 Weather Reports

Periodic weather reports can be sent based complex user defined schedule. To view the schedule, select the calender from the panel.

The weather report sends the parameters specified in the File Settings Panel. To view, this panel, select the parameter icon from the panel. The names and units are based on the entries, providing foreign language support.

The weather report data is appended to the Email message specified in the Email panel.

8.16.3 Email Alarms

Email alarms can be sent based on alarm conditions. *See Alarms* for more information. To view the alarms panel, select the Alarm icon from the display panel.

8.16.4 Reporting Alarm Codes Only

Instead of sending a message, a simple fault code can be sent. This is important for Email pagers where message length and bandwidth are important.

Referencing the Email alarm panel, if condition 1 is met, the fault code “1” will be sent. If conditions 1 and 2 are met, the fault code “12” will be sent.

8.17 METAR

8.17.1 General Description

Beginning 1 July 1996, the United States undertook the most significant change for observing, reporting, and coding surface weather observations and terminal forecasts in the past forty years. Not since the early 1950s, when the present airways code (commonly known as Surface Aviation Observation or SA code), and Terminal Forecast (FT) codes were adopted, has there been such a major code change for weather observations and forecasts.

On 1 July 1996, the international standard code for hourly and special surface weather observations, METAR/SPECI, took effect.

The METAR acronym roughly translates from the French as *Aviation Routine Weather Report* . A special report, SPECI, is merely a METAR formatted report which is issued on a non-routine basis as dictated by changing meteorological conditions.

The SPECI acronym roughly translates as *Aviation Selected Special Weather Report* . Meanwhile, the international standard code format for terminal forecasts issued for airports, TAF , also took effect. The acronym translates to *Aerodrome Forecast* .

The Federal Aviation Administration (FAA), which determines aviation requirements in the United States, has determined that the domestic transition to the METAR/TAF code is vital to the standardization of these reports worldwide. The National Weather Service (NWS) and Department of Defense (DOD) are complying with this requirement.

The benefits of having the U.S. standardize to these new code formats are as follows. Hourly and special observations are used both as stand alone data for the sites

and as inputs to global weather models for both analysis and forecasting. It is this global use of each small bit of information which drives the need for standardization.

Additionally, the increase in international flights between the U.S. and other nations from more U.S. locations than ever before lends itself to developing a more "seamless" international standard for aviation. Moreover, standardization becomes vital for the general aviation community for flights from the U.S. to Canada, the Caribbean Area, and Mexico.

8.17.2 Finding METAR Reports

METAR reports worldwide can be found at the NOAA anonymous ftp server in the following text file formats:

Individual Decoded Reports
ftp://weather.noaa.gov/data/observations/metar/decoded/

Individual Coded Reports

8.17.3 Locating a Station Near You

The NOAA provides a convenient map for locating a METAR station near your. Click on the following link to go to the map:

http://www.faa.gov/asos/map/map.htm

8.17.4 METAR Station Setup

Menu Shortcut: METAR ▶ Station Setup

Reference Figure 57 – METAR Station Setup .

To display METAR data on your desktop and generate a history based on METAR reporting stations, select **Add New Station to List**.

Each METAR station requires an identifier. To find a list of identifiers, select one of the following buttons:

- ✓ **View Worldwide Station List**. Provides a list of stations around the world
- ✓ **View USA Station Map**. Find a station near you in the USA.
- ✓ **View Independent Station List**. Provides a list of independent station owners (like yourself). You can join the network of independent station owners by following the instructions at www.weatherforyou.com.

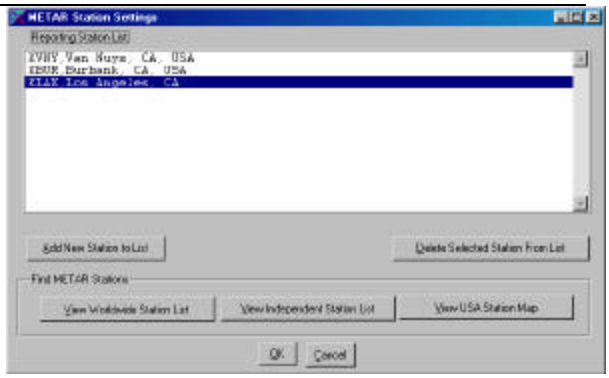


Figure 57 – METAR Station Setup

8.17.5 Displaying METAR Icons on the Desktop

Menu Shortcut: Modify Display▶ METAR Icons

Figure 58 – METAR Icon

After you have selected a specific METAR station for download, you can display this data on your desktop.

Reference Figure 59 – METAR Icon Display Settings. Enter the Site identifier and the title your wish to display on your desktop.

To display the icon, check the Display Checkbox. Create a jpg file if you wish to display the image on your website. The files are named icon1.jpg to icon30.jpg based on the display number.

The jpg images are saved in the same file location as the other desktop images unless you specify a different directory on the panel.

The icon background changes from day to night based on your local sunset time. To adjust the day and nighttime text color, select the color boxes.

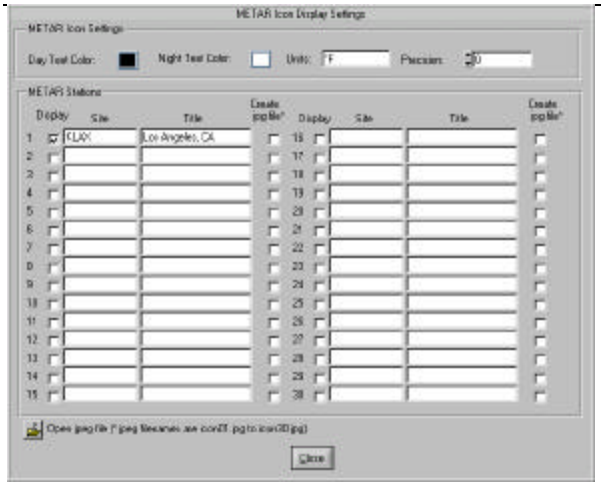


Figure 59 – METAR Icon Display Settings

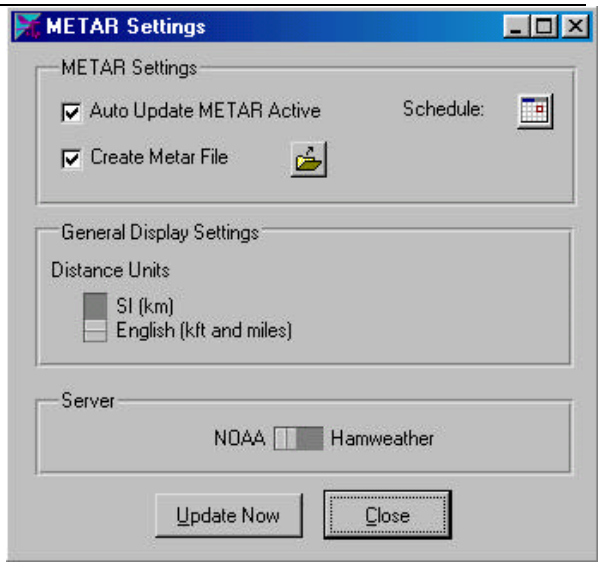


Figure 60 – METAR Icon Settings

8.17.6 METAR Settings

Menu Shortcut: Modify Display▶ METAR Icons

To define METAR settings, select [Modify Display][METAR Icons] from the Menubar.

The following METAR settings are adjustable.

Parameter	Description
Auto Update METAR Active	This checkbox must be selected to automatically fetch METAR data from the server
Create METAR File	Creates a METAR text file summary report
Schedule	A schedule must be defined to automatically update METAR data
Distance Units	METAR cloud height and visibility is expressed in km or kft and miles
Server	There are two servers to obtain data. The NOAA server is the official government server, but is slow and does not include private weather station owners. The HamWeather Server is a mirror server, is much faster, and provides access to the network of personal weather station owners data

Table 15 – METAR Settings

8.17.7 METAR Report Generator

Menu Shortcut: METAR ▶ METAR Generator

Since METAR is the reporting standard for weather observations, VWS generates METAR reports so you can share weather data. VWS also includes an interpreter, so you can interpret other METAR reports. The main reason users put their information on the internet is to share data. VWS provides a conduit for sharing weather information.

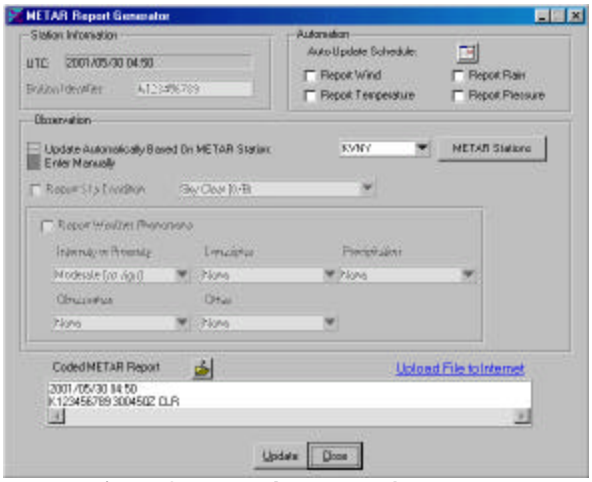


Figure 61 – METAR Report Generator

8.17.8 METAR Text Reports

Three text reports are available from METAR generated data. The following section describes the METAR reports and locations.

8.17.8.1 METAR Summary Text Report

The METAR summary text reports are located in the following file location:

- ✓ \data\metar.txt

Location	Last Update	Temp	Dew	HtIx	Chill	%Rh	Press	Rain	Wind	Wind	Wind	Visib	Cloud Sky/Weather
	Date and Time	°F	°F	°F	°F	%	in	in	Dir	Spd	Gust	miles	kft
Van Nuys	05/29/2001 09:51pm	66	61	71	66	83	29.91	---	ESE	4	4	10	--- Clear/
Burbank	05/29/2001 08:53pm	68	55	70	63	64	29.90	---	ESE	9	9	10	--- Clear/
Los Angeles	05/29/2001 09:50pm	63	59	68	60	88	29.92	---	WSW	6	6	9	--- Clear/

Figure 62 – METAR Summary Reports

8.17.8.2 METAR Historical Text Report

The METAR historical text reports are located in the following file location:

\data\KABC.txt

where KABC is the METAR identifier.

Date / Time	Temp	Dew	HtIx	Chill	%Rh	Press	Rain	Wind	Wind	Wind	Visib	Cloud Sky/Weather
	°F	°F	°F	°F	%	in	in	Dir	Spd	Gust	miles	kft ---/---
03/31/2001 12:50pm	64.4	57	68.3	57	77	29.99	---	---	11	11	3	2.0 Overcast/ Haze
03/31/2001 01:50pm	64.4	57	68.3	57	77	29.97	---	WSW	12	12	3	2.0 Broken Clouds/ Haze
03/31/2001 01:50pm	64.4	57	68.3	57	77	29.97	---	---	12	12	3	2.0 Broken Clouds/ Haze
03/31/2001 02:50pm	62.6	57	67.2	55	83	29.95	---	WSW	11	11	4	2.0 Broken Clouds/ Haze
03/31/2001 03:26pm	62.6	57	67.2	55	83	29.94	---	WSW	12	12	4	1.1 Broken Clouds/ Haze
03/31/2001 03:26pm	62.6	57	67.2	55	83	29.94	---	---	12	12	4	1.1 Broken Clouds/ Haze
03/31/2001 03:50pm	60.8	57	66.1	52	88	29.94	---	WSW	12	12	4	1.1 Overcast/ Mist
03/31/2001 04:07pm	60.8	55	65.4	52	82	29.93	---	WSW	12	12	3	1.1 Overcast/ Mist
03/31/2001 04:50pm	59.0	55	64.3	51	88	29.93	---	WSW	10	10	0.50	0.9 Overcast/ Mist
03/31/2001 05:50pm	59.0	55	64.3	51	88	29.93	---	SW	10	10	0.50	0.9 Overcast/ Mist
03/31/2001 06:29pm	57.2	55	63.4	50	94	29.94	---	WSW	9	9	3	0.9 Overcast/ Mist
03/31/2001 06:29pm	57.2	55	63.4	50	94	29.94	---	---	9	9	3	0.9 Overcast/ Mist
03/31/2001 06:50pm	57.2	55	63.4	48	94	29.94	---	W	11	11	3	0.9 Overcast/ Mist
03/31/2001 06:50pm	57.2	55	63.4	48	94	29.94	---	---	11	11	3	0.9 Overcast/ Mist
03/31/2001 07:50pm	57.2	55	63.4	52	94	29.95	---	W	8	8	3	0.9 Overcast/ Mist
03/31/2001 07:50pm	57.2	55	63.4	52	94	29.95	---	---	8	8	3	0.9 Overcast/ Mist
03/31/2001 08:50pm	57.2	55	63.4	50	94	29.96	---	WSW	9	9	3	0.9 Overcast/ Mist
03/31/2001 09:50pm	57.2	54	62.5	54	88	29.95	---	WSW	6	6	3	0.9 Overcast/ Mist

Figure 63 – METAR Historical Reports

8.17.8.3 METAR Raw Data

The raw METAR data is located in the following file location:

\metar\KABC.txt

where KABC is the METAR identifier.

```
2001/06/03 18:56
KPHX 031856Z 28010G15KT 10SM CLR 34/M01 A2967 RMK AO2 SLP025 T03391006 $
```

Figure 64 – Raw METAR Data

8.17.9 Learning More About METAR

To learn more about METAR, visit the United States Government **National Oceanic and Atmospheric Administration** Website at http://www.nws.noaa.gov/oso/oso1/oso12/overview.htm

8.18 Weather Servers

8.18.1 Weather Underground

8.18.1.1 Weather Underground Settings

Menu Shortcut: Weather Underground ▶ Sign-up

To register your weather station as a private weather station, select the Sign-up Your Station button and proceed

by registering your weather station or select the following link:

http://www.wunderground.com/weatherstation/index.asp

After registering, your information will be displayed on the Weather Underground site real-time. This allows anyone in the world to view your data, including up to the minute reports, daily highs and lows, graphical, and text data.

8.18.1.2 Weather Underground Rapid Fire

Weather Underground allows you to send data and update on the Weather Underground "real-time". This feature requires a constant connection to the Internet.

Select a timer (based on the update rate of your weather station).

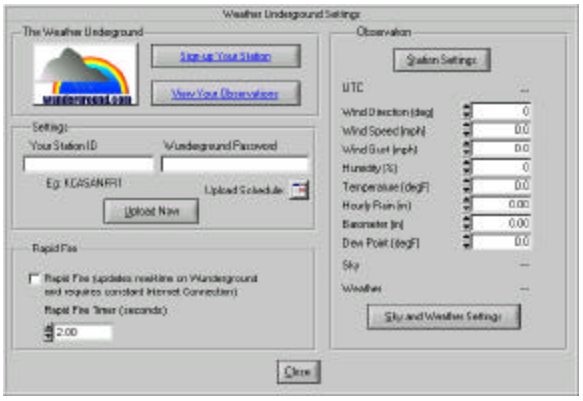


Figure 65 – Weather Underground Setup

8.18.1.3 Weather Warnings

Menu Shortcut: Wunderground ▶ Weather Warnings

Virtual Weather Station will download Weather Warnings from Weather Underground, and display this information on your desktop, create text files for inclusion on your webpage, and sound audible alarms.

8.18.1.3.1 Warning Locations

Enter a location (example, Seattle) and state (example, WA). If the location is invalid, please visit Wunderground.com and enter a city and state to check the validity of the location.

8.18.1.3.2 Warning Alarms

An audible alarm or executable can be run in the event of a weather warning. The alarm priorities are based on the following:

Warning	Priority
Special Weather Statement	1
Winter Weather Statement	1
Local Storm Report	1
Record Report	1
Public Information Statement	1
Dense Fog Advisory	2
High Wind Advisory	2
Heat Advisory	2
Fire Weather Advisory	2
Small Hail	2
Big Hail	2
Tornado Watch	3
Severe Thunderstorm Watch	3
Severe Weather Statement	3
Heavy Snow	3
Flood Watch / Flood Statement	3
Tornado Warning	4
Flood Warning	4
Severe Thunderstorm Warning	4
Local Hurricane Statement	4
Severe Thunderstorm Warning	4
Lightning	4
Deaths or Injuries	4
Tornado	4
Flooding	4
Wind Damage	4

Table 16 – Weather Warnings and Priorities

8.18.1.3.3 Weather Warning Text Reports

Text reports are generated for each location (numbered 1 through 15) in the following location:

\vws\data\warnings\#.txt

where # is the location number.

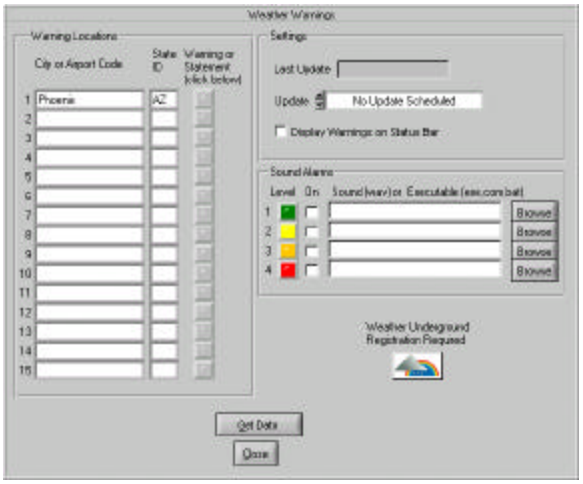


Figure 66 –Weather Warnings

8.18.1.4 Climate Report

Menu Shortcut: Wunderground ▶ Climate Report

Virtual Weather Station will download climate data for each day of the year. This data includes record highs and low temperature and year they occurred, normal high and low temperature, and monthly and yearly rainfall to date.

This information can be included on your webpage using tags. For information, reference Table 14 – Index of HTML Tag Names.

Text reports are generated for each location (numbered 1 through 15) in the following location:

\vws\data\cliamte\#.txt

where # is the location number

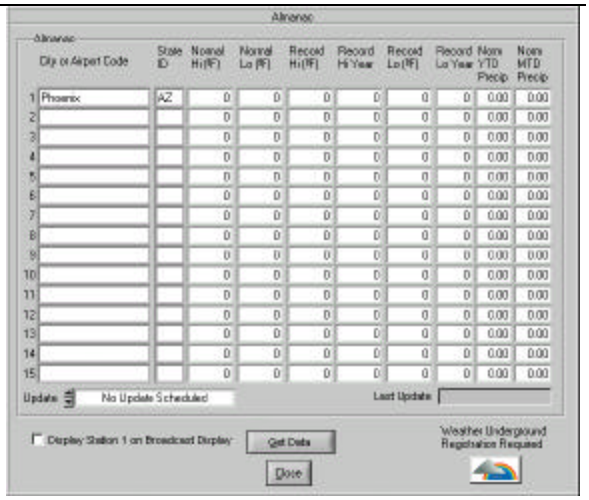


Figure 67 - Climate Reports

8.18.1.5 Five Day Forecast

Menu Shortcut: Wunderground ▶ 5-Day Forecast

Virtual Weather Station will download the 5-Day forecast data from the National Weather Service for any location around the world.

This information can be included on your webpage using tags. For information, reference Table 14 – Index of HTML Tag Names.

Text reports are generated for each location (numbered 1 through 15) in the following location:

\vws\data\forecast5\#.txt

where # is the location number.

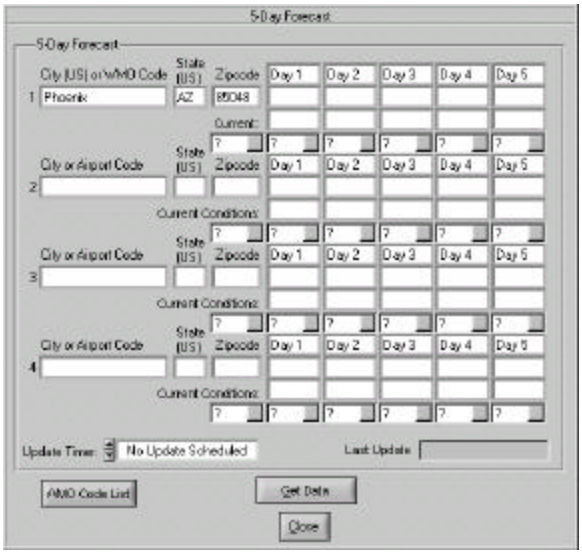


Figure 68 – Five Day Forecast

8.18.1.6 Mesonet

Mesonet is a combination of the words "mesoscale" and "network".

In meteorology, "mesoscale" refers to weather events that range in size from a few miles to a few hundred miles. Mesoscale events last from several minutes to several hours. Thunderstorms and squall lines are two examples of mesoscale events.

A "network" is an interconnected system.

Thus, the Weather Underground Mesonet is a system designed to measure the environment at the size and duration of mesoscale weather events.

Your weather station is an important tool for meteorologists and hobbyists to predict local weather conditions. It is important you maintain your weather station, including proper installation and calibration.

Virtual Weather Station allows you perform an “end-to-end calibration” by applying a gain and offset to the measured parameter.

8.18.1.6.1 Mesonet Settings

Menu Shortcut: Wunderground ▶ Mesonet Settings

8.18.1.6.1.1 Location and State

Enter a location (example, Seattle) and state (example, WA). If the location is invalid, please visit Wunderground.com and enter a city and state to check the validity of the location.

You can also enter an airport code (example, KPHX). For a list of airport or weather station codes, select the KPHX example link to visit the FAA website.

8.18.1.6.1.2 METAR Only

Select this option to view a METAR station only. This is useful if the same two different locations yield the same MESONET personal weather stations.

8.18.1.6.1.3 Ignore Station List

You may want to ignore a station that is reporting bad data. To remove it from the list of reporting stations, and the station identifier to this list (example, KPHX).

Figure 69 – Mesonet Settings

8.18.1.6.2 Mesonet Report

Menu Shortcut: Wunderground ▶ Mesonet

A color coded Mesonet report is generated. This report allows you to quickly determine where conditions are changing.

You can sort the data by selecting the column header.

Stations listed in Gray are official METAR stations.

For more information about each station or location, select the links provided in the table.

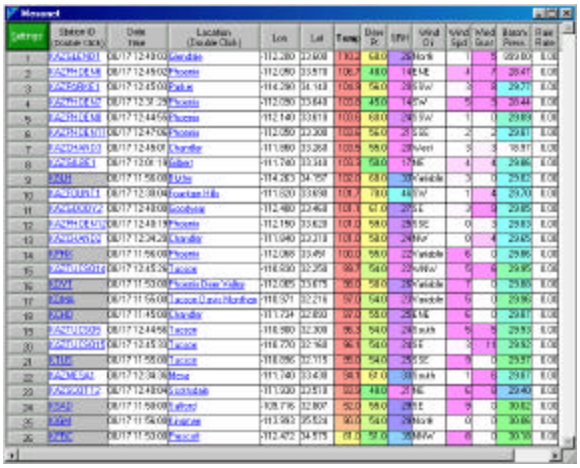


Figure 70 - Mesonet Report

8.18.1.7 Mesonet Map

Menu Shortcut: Wunderground ▶ Mesonet Settings

You can create a map and add all of the stations located in the Mesonet. Background maps can be customized, and real-time radar maps such as the image shown in Figure 71.

To create a map background, you must determine the longitude and latitude of all four corners of the map. Virtual Weather Station will automatically place the weather stations in the proper location.

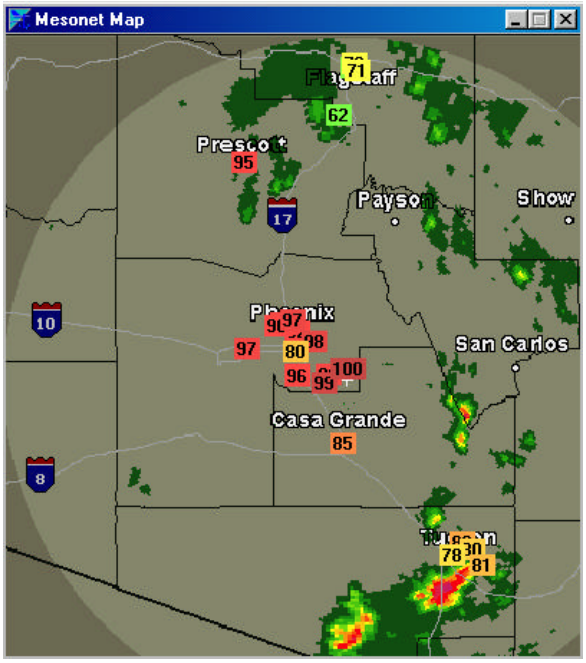


Figure 71 - Mesonet Map with Personal Weather Stations and Real-time Radar

8.18.1.7.1 Automation

8.18.1.7.1.1 Automatic Update

This setting must be checked to automatically update the map background image, Mesonet data and save the image to file.

To update the Mesonet map manually, select the **Update Now button**.

8.18.1.7.1.2 Start Hidden

To hide the Mesonet Map at start -up, select this option.

8.18.1.7.2 Map Image

The map image settings control the background map display properties.

8.18.1.7.2.1 Longitude and Latitude

Enter the longitude and latitude of the four corners of the map.

Note that longitude values are negative for the United States. A common mistake is to enter a larger value (less negative) on the left hand side of the map then the left hand side of the map.

8.18.1.7.2.2 Image Height and Width

Specifies the height and width of the background image. This settings will compress (pan) or enlarge (zoom) the image.

8.18.1.7.2.3 Canvas Height and Width

Specifies the height and width of the map canvas. This setting crops the right hand side and the bottom of the imge.

8.18.1.7.2.4 Nudge Map

Nudge the map to the left right, up or down. This feature allows you to place the corner of the map at pixel coordinates (0,0).

8.18.1.7.3 Style

Control the style of the parameters placed onto the map image.

8.18.1.7.3.1 Numeric Background

Controls the background field of the weather station parameter displayed.

The color of the background will automatically change as a function of the parameter value if the spectrum option is selected.

8.18.1.7.3.2 Numeric Color

Controls the text of the weather station parameter displayed.

The color of the background will automatically change as a function of the parameter value if the spectrum option is selected.

8.18.1.7.3.3 Color Spectrum

Select upper and lower limits for the color spectrum. The lightness adjustment (0-255) controls the darkness of the background to provide better contrast with the numbers.

8.18.1.7.3.4 Font Settings

Customize the font size, type, and format (bold or italic).

8.18.1.7.3.4.1 Title and Date Stamp

This feature adds a title and a time and date stamp to the upper left hand corner of the image.

8.18.1.7.4 Background Map

You can insert a static or dynamic background map into the display. Virtual Weather Station automatically detects when the map is updated to provide a real-time flavor.

8.18.1.7.5 Jpg File

The Mesonet data can be output to a jpg file for inclusion into your webpage. This file is then uploaded to the Internet along with the other jpg files.

8.18.1.7.6 Hotlink Map

When this option is checked, Virtual Weather Station will automatically format a webpage with hotlinks to Weather Underground and the National Weather Service, as well as provide descriptive mouse over text.

The HTML page that the image is inserted into must reside in the HTML Settings panel.

For more information on HTML settings, reference Section 8.12.

Figure 72 –Mouse over and link affects with Hotlink Map feature.

8.18.1.7.7 Mesonet Settings

Select one of the station parameters to display. To change the mesonet data displayed on the map, select the **Mesonet Settings** button.

8.18.1.7.8 Data Age (only display last xx minutes)

You can delete stations that have expired based on a defined time frame. For example, if the reported data is over one hour old, you may want to remove it from the map display.

Figure 73 - Mesonet Map Settings

8.18.2 Weatherforyou Weather Server

Menu Shortcut: Servers ▶ Weatherforyou

Weatherforyou.com and Hamweather.com have teamed to provide a powerful networking weather service for personal weather station owners.

To register your weather station as a private weather station, select the Sign-up Your Station button and proceed by registering your weather station at Hamweather.

8.18.3 APRS

Menu Shortcut: Servers ▶ APRS

APRS is a which uses amateur radio to transmit position reports, weather reports, and messages between users.

Reference the links provided in **Figure 74 – APRS Settings** for more detailed information. Ambient does not actively participate in the APRS service, but provides the text files for generating APRS data in support of the network.

You can download the APRS utility program to post your data live on the Internet at

http://www.AmbientWeather.com/AmbientForum/dl_info.asp?id=29

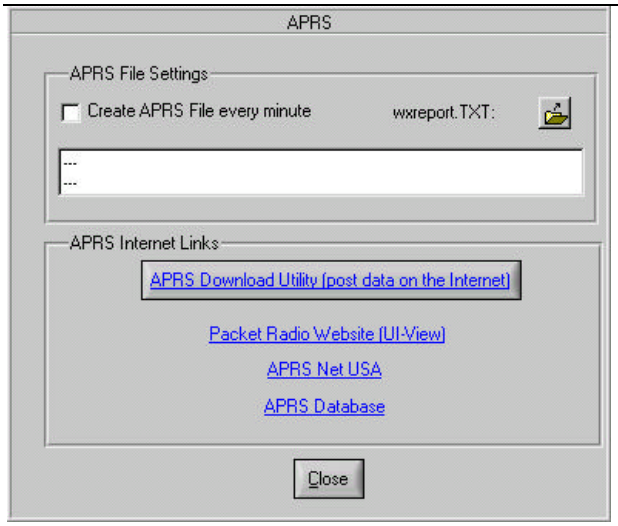


Figure 74 – APRS Settings

8.19 Internet Status and Log

Menu Shortcut: Help ▶ Internet Status and Log

8.19.1 Turning Off the Internet Functions

To turn off all internet functions, select the Turn Off All Internet Features switch.

8.19.2 Error Messages and Log

Error messages for Internet and communication events can be viewed from the Error Messages panel. To view the error messages panel, select [Help][Internet Error Messages and Log] from the menubar.

An Internet log captures events and errors during operation. To view this error log, select the open folder button. It is recommended you view this error log prior to contacting Ambient Software. Attaching this error log to an Email to Ambient Software is highly recommended to identifying problems. The error log is stored in \data\log.txt.

You can configure the software to write to the file (1) when an Internet related event occurs or (2) an Internet related error occurs.

NOTE: The Internet log file can get very large. It is recommended that the log file record fault data only unless advanced troubleshooting is required, and the size of this file is monitored. The log file is automatically deleted every month.

8.19.3 Operating States

This feature is for advanced troubleshooting purposes and allows the user to view operational states, and determine any timeout problems with Internet functions. For more information, contact support@AmbientWeather.com.

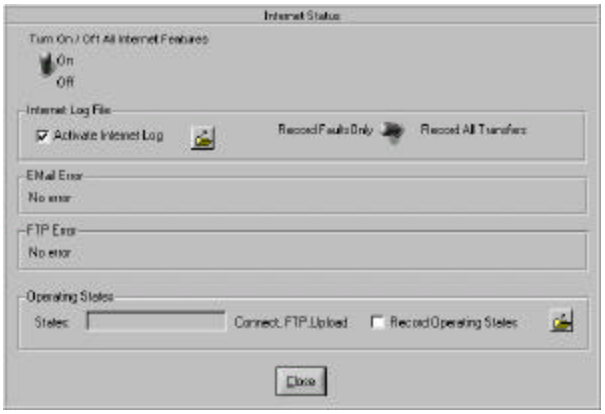


Figure 75 – Internet Status Messages and Error Log

9 Virtual Weather Station Add-ons

9.1 X10 Home Automation with Virtual Weather Station, HomeSeer (Base or Pro Version of Virtual Weather Station Required)

9.1.1 General Description

You can connect your home automation system to your personal weather station, and create a powerful environmental monitoring system.

Ambient makes this possible with **Virtual Weather Station's Home Automation System** (http://www.AmbientWeather.com/x10). The combination of your weather station and automated controls improves the comfort and efficiency of your home at a fraction of the cost of other automated environmental systems.

With Virtual Weather Station's home automation plug-in tools, you can:

- ✓ Control the thermostat based on feedback signals from handheld temperature sensors placed throughout your home, or a low cost zone control system.
- ✓ Monitor and control the thermostat based on Comfort Index or change thermostat set points based on rate of change of temperature.
- ✓ Turn on the ceiling fan when the bedroom comfort index is exceeded.
- ✓ Control whole house fans to draw in cool air from the outside when the outdoor temperature is lower than the inside temperature

- ✓ Control sprinkler systems after a rain.
- ✓ Control your irrigation system
- ✓ Monitor and control your pool, spa or air conditioning systems.
- ✓ Monitor your home automation and environmental conditions from anywhere in the world over the Internet.

9.1.2 X10 Controls

Virtual Weather Station communicates to HomeSeer (www.homeseer.com) home automation software to provide a complete environmental control and monitoring system using X10 Control Technology.

X10 is a communications protocol based on Powerline Carrier (PLC) technology, which uses your home's existing electrical wiring to communicate with controls lights and appliances. X10 is easily installed into existing homes, and X10 control devices can be upgraded or changed easily.

9.1.3 HomeSeer Automation Software Description

HomeSeer is home automation software that uses inexpensive X10 technology to control your lights, appliances, and audio/video equipment. With a built-in web browser, access to your home is only a click away. HomeSeer was designed to be easy to use, affordable, and extendable. Novice users will find the clean Outlook like interface easy to understand, while power users will welcome the ability to create sophisticated scripts to control just about anything.

9.1.4 How the Home Automation System Works

Virtual Weather Station communicates to HomeSeer using a Plug-in module provided with Virtual Weather Station's Home Automation Toolkit. HomeSeer can be programmed to automatically control your home or business by communicating via RS232 or USB to a X10 Computer Interface Module.

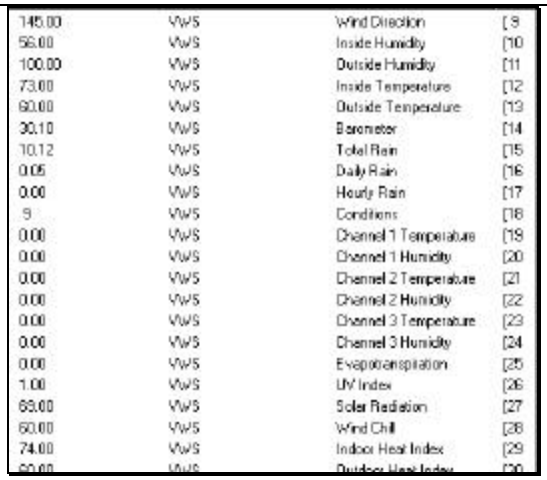

145.00 VWS Wind Direction [9
55.00 VWS Inside Humidity [10
100.00 VWS Outside Humidity [11
73.00 VWS Inside Temperature [12
60.00 VWS Outside Temperature [13
30.10 VWS Barometer [14
10.12 VWS Total Rain [15
0.05 VWS Daily Rain [16
0.00 VWS Hourly Rain [17
9 VWS Conditions [18
0.00 VWS Channel 1 Temperature [19
0.00 VWS Channel 1 Humidity [20
0.00 VWS Channel 2 Temperature [21
0.00 VWS Channel 2 Humidity [22
0.00 VWS Channel 3 Temperature [23
0.00 VWS Channel 3 Humidity [24
0.00 VWS Evapotranspiration [25
1.00 VWS UV Index [26
63.00 VWS Solar Radiation [27
60.00 VWS Wind Chill [28
74.00 VWS Indoor Heat Index [29

Figure 76 –Virtual Weather Parameter Listing in HomeSeer.

9.1.5 Configuring HomeSeer

After purchasing and installing HomeSeer and the HomeSeer Virtual Weather Station Plug-in, configure HomeSeer as follows.

From Virtual Weather Station

- ✓ Select **Settings | Csv Export** from the Virtual Weather Station main menu.
- ✓ Select the Create csv output file checkbox and browse to a location on your hard drive to store the csv file.

From HomeSeer

- ✓ Select **View | Options** from the HomeSeer Main Menu, and select the **Interfaces** Tab.
- ✓ Under the RF, I/O, Custom Interface Field, Select device to add: VWS Interface.
- ✓ Select **VWS Interface** in the window and select the **Setup** button.
- ✓ Browse to the csv file location specified in Step 2.
- ✓ Select the **Create Variables** Button to list the 39 variables VWS imports to HomeSeer. These variables will now be listed in the HomeSeer Main Menu.

9.1.6 Purchasing the Virtual Weather Station HomeSeer Plug-in

To purchase the HomeSeer plug-in, visit

http://www.ambientweather.com/ExtDesc.asp?id=113

9.2 WeatherVoice (Internet Version of Virtual Weather Station)

Menu Shortcut: Settings ▶ WeatherVoice

Turn any PC into a Weather Report Telephone Call Center with Ambient's WeatherVoice add-on.

Anyone can keep up to date on your local weather, anywhere. Advertise your services, keep a watchful eye on your home, cabin or business, indoors and out, with a simple phone line and voice modem.

Ambient makes this possible with Virtual Weather Station's Voice Generation System. For more information, visit

http://www.ambientweather.com/Ext Desc.asp?id=542

Virtual Weather Station's WeatherVoice is a text to speech converter. WeatherVoice is compatible with most text-to-speech voices.

These text files can be automatically updated, inserting real-time weather conditions from your weather station, or even forecasts and warnings from the National Weather Service.

With WeatherVoice, you can:

- ✓ Use Virtual Weather Station's File Tags to insert live weather conditions from your weather station or your local METAR station into your outgoing answering message
- ✓ Download from the Internet and insert any text file into the outgoing answering message to provide weather forecasts and warnings
- ✓ Use spoken audio files as background sounds on your website
- ✓ Combine with a third party PC Auto Call Center to provide a complete PC-based phone answering system. Keep up to date on your local weather, advertise your service, and stay connected to the weather!

9.2.1 What you Need to Get Started

You need the following to create a sophisticated Weather Reporting Call Center:

- ✓ A personal weather station, or Internet connection to over 7,000 METAR weather stations around the world
- ✓ Ambient's Virtual Weather Station Base, Pro or Internet Edition
- ✓ Ambient's WeatherVoice Add-on
- ✓ A Voice Modem. Most modems provide Voice/Data/Fax
- ✓ A third p arty Call Center Software. We recommend ***Advanced Call Center***: http://www.voicecallcentral.com/advancedcallcenter.htm

9.2.2 WeatherVoice General Description

WeatherVoice converts text files with "tags" into actual weather data, and then converts these files into wav files, which can be played back on your computer or voice modem. "File Tags" can also be inserted into the text file.

An example text file is as follows:

Text File	Converted File

Thank you for calling Ambient, your Weather Superstore. The current temperature is ^vxv007^ degrees. The high today was ^vhi007^ and the low today was ^vlo007^ The current wind speed is ^vxv003^ miles per hour.
 	
The current temperature at Los Angeles Airport is `^mtr004KLAX^ degrees.`
 	
`The forecast for the greater Los Angeles area is as follows:`
 	
^c:\vws\data\forecast.txt^
	Thank you for calling Ambient, your Weather Superstore. The current temperature is 74 degrees. The high today was 74 and the low today was 53. The current wind speed is 12 miles per hour.
	
	The current temperature at Los Angeles Airport is `72 degrees.`
	
	`The forecast for the greater Los Angeles area is as follows:`
	
	`TODAY...LOW CLOUDS AND FOG THROUGH MID MORNING...OTHERWISE MOSTLY SUNNY. HIGHS IN THE 80S TO LOWER 90S. .TONIGHT THROUGH MONDAY...AREAS OF LATE NIGHT THROUGH MID MORNING LOW CLOUDS AND FOG...OTHERWISE MOSTLY CLEAR. LOWS IN THE MID 50S TO MID 60S. HIGHS IN THE MID 80S TO MID 90S. .MONDAY NIGHT THROUGH TUESDAY...MOSTLY CLEAR.`

Table 17 – Text to Wav File Conversion takes tag information and converts it to text files. For more information on obtaining National Weather Service text data, please visit http://weather.noaa.gov/pub/data

9.2.3 TTS Voices and Microsoft's TTS Center

The Microsoft Text-to-Speech engine was included with your WeatherVoice distribution kit. The text-to-speech engines can be found at the following link:

http://www.microsoft.com/products/msagent/downloads.htm#tts

Sample free TTS voices have been compiled below for your convenience.

Microsoft Text-to-Speech Engines

Mary, Mike, Sam and More (7.3MB)

L&H TruVoice TTS Engines

American English (0.99MB)
British English (2.54MB)
Dutch (2.58MB)
French (2.24MB)
German (2.18MB)
Italian (1.97MB)
Japanese (3.00MB)
Korean (3.03MB)
Portuguese (2.39MB)
Russian (2.85MB)
Spanish (2.36MB)

The best TTS voices on the market are sold by AT&T Labs Natural Voices:

www.naturalvoices.att.com/

and are available for purchase at

www.AmbientWeather.com/WeatherVoice

9.2.4 WeatherVoice Set-up

"Tag Files" or templates placed in the directory \vws\voices\text are converted to the actual text that will be spoken, and then converted again to wav files. You can place as many files as you want into the file directory.

The file structure is as follows:

Templates (\vws\voices\text*.txt) ▶

Temporary Files (\vws\voices\temp*.txt) ▶

Temporary Files (\vws\voices\wav*.wav)

For more information on Tags, please reference Section 8.13.1.

9.2.4.1 Open Text File

Browses to the template text files created by the user located in the directory \vws\voices\text.

9.2.4.2 Converted File

Browses to the directory location \vws\voices\temp where the converted files are located. These files are then converted to wav format

9.2.4.3 Open Wav File

Browses to the directory location \vws\voices\wav where the wav files are located.

9.2.4.4 Voices

Provides the list of voices loaded on your computer. To load more voices, please visit www.AmbientWeather.com/WeatherVoice from the Download New Voices Link.

9.2.4.5 Text to Wav Conversion Timer

The timer schedule for automatically updating the text to wav files. The files can be converted now by selecting the Convert It! Button.

9.2.4.6 Voice Speed

The voice speed in words per minute.

9.2.4.7 Volume

The voice volume in percent.

9.2.4.8 Pitch

The voice pitch or frequency in Hertz.

9.2.4.9 Sample Rate

The sample rate of the converted speech (wav) file. The output sampling rate is based on your modem or application. Most modem output frequency is 8,000 Hz. Most computer applications are recommended at 16,000 Hz.

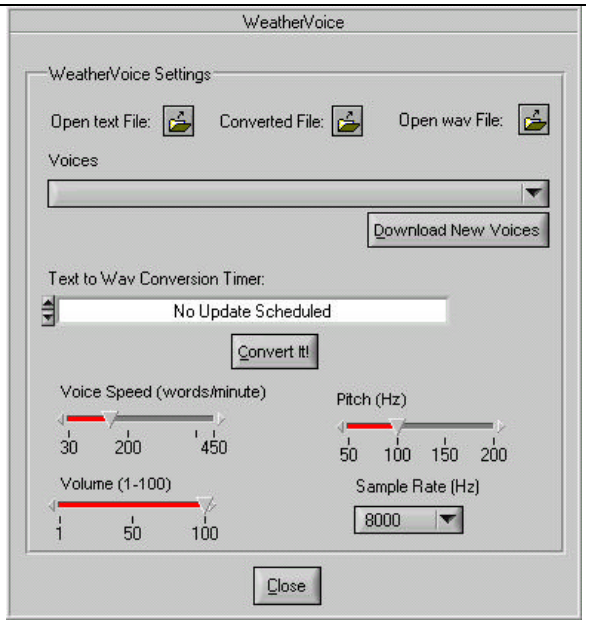
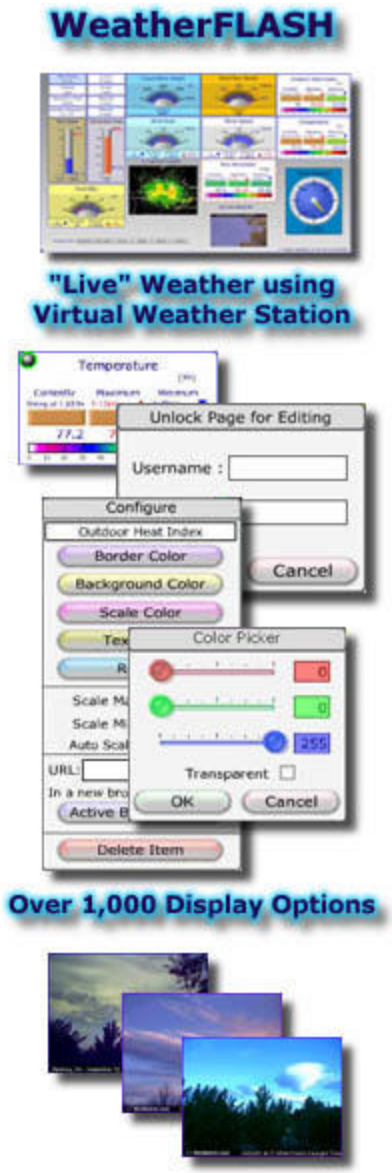


Figure 77 – WeatherVoice Set-up Panel

9.3 WeatherFlash (Internet Version of Virtual Weather Station Required)



WeatherFlash is the first Web-based, real-time, comprehensive monitoring and analysis interface that is completely controlled by you! You pick the display options, you pick the colors, you design the layout, you select the update interval. With Ambient's WeatherFlash, you are in control.

- View **WeatherFlash** with the most popular browsers, Netscape, Opera, Mozilla, IE and more
- Quickly and easily configure **WeatherFlash** using your favorite browser
- Display only the information that you choose including text, graphs, off-site graphics, and more
- **WeatherFlash** is not limited like our competitors products
- **Color WeatherFlash** your way, utilizing the complete Web compatible color palette
- **WeatherFlash** updates from 1 second to 1 minute, to once daily... its up to you
- Absolutely no programming knowledge is required to use **WeatherFlash**
- No need to run out and buy Macromedia Flash... **WeatherFlash** is self-contained
- **WeatherFlash** is not limited by your ISP's Web server... it runs in your browser
- **WeatherFlash** does not require any DLL's, special hardware or software to be installed
- **WeatherFlash** allows multiple-page displays

Figure 78 - WeatherFlash

Virtual Weather Station brings your PC to life, but add-on Ambient's **WeatherFlash**, with it's rich array of dynamic and colorful gauges, dials, graphs and charts, and now your Web site will come alive for your visitors too! Using Ambient's **WeatherFlash**, you are in complete control of everything.

The **WeatherFlash** interface is completely customizable - you can arrange the virtual instruments based on your own personal preferences, select your colors, update interval, and much more. **WeatherFlash**, and your imagination, you literally can choose from over 1,000 ways to display your weather data, in "real-time".

WeatherFlash is keyed to your site, so multiple instances of **WeatherFlash** may be hosted on the same Web server. Each installation only requires about 50Kb of storage, and the data files are less than 2Kb in size. Data may be sent to **WeatherFlash** via HTTP post using Active Server Pages or using your current FTP access.

To learn more about WeatherFlash, please visit

http://www.AmbientWeather.com/WxFlash/

9.4 Image Salsa

ImageSalsa captures images from your webcam and creates a series of jpeg images for web page insertion, real-time streaming video, graphical and text overlays, and integrates with Virtual Weather Station to create real-time weather displays.

Imagine watching the clouds roll in and out using the time lapse photography feature, and then overlaying weather data to monitor the changing weather conditions. A must for every Virtual Weather Station and WeatherCam Owner, ImageSalsa give your webpage that professional tv broadcast look.

ImageSalsa stands up against any WebCam authoring tool on the market today at a fraction of the price!

Figure 79 – ImageSalsa

10 Troubleshooting Tips

Problem	Solution
The program is not communicating to the weather station (the instrument panel is not updating)	Verify you have selected the correct Weather Station in Virtual Weather Station. To view this winow, select the menu item **Communication | Communication**. Verify that you have the correct communication port selected. If you are unsure which comport is correct, select **[Start][Settings][Control Panel]** from the **windows** menubar and **select [System][Device Manager] and Ports**. If COM1 is designated, your comport is Communication Port 1. Verify you are using the proper cable. A standard 9-pin serial cable is required. *Do not use a NULL modem cable.* If another program is using the serial communication port, quit the program. Two programs can not share the same serial port. If you own a Palm Pilot or similar device (such as a digital camera), the software is often configured to open at startup of your computer, and "steals" the serial comport, even if the device is not connected. Select "Ctrl-Alt-Del" once, and see if any external device software is running. Verify your station is not running on batteries and is connected to AC power. Your communication port is locked-up. Cycle power to the computer Your weather station console's communication port is locked up. Cycle power to the console. You have a hardware device conflict. It is recommended that you contact your PC vendor or PC technical support. Your serial port uses a non-standard IRQ line

Problem	Solution
	Your serial port is defective Your weather station serial port is defective. Unplug the station's AC adapter from the utility and run the station on battery power. If the LEDs display communication, reconnect the station's AC adapter. If the unit stops communicating again, contact Oregon Scientific. See Advanced Communication Troubleshooting Tips
Communication only occurs while on the batteries and not the AC.	If RTS (request to send) control line is low, communications will only occur when on batteries. This condition will occur if you are using a 3-wire (pins 2,3,7) serial cable, or if for some other reason, the computer serial port is not asserting RTS. Use a standard 9-pin serial cable.
A script error or fatal error occurs during installation.	Close all programs before installation. If the problem persists, reboot your computer and make sure no programs are running. Turn off the virus protection. This can interfere with the installation process.
The program crashes or you receive the following Windows Message: "This Program Has Received an Illegal Operation and Will Shut Down"	If your microprocessor is overheating, you may receive this message from the operating system. Keep your computer in a cool place to reduce crashes Some low power mode or power savers will cause the program to crash when communicating to the serial port. Turn off the power saver by selecting Right Click on the desktop, Properties, Screen Saver, Settings (Energy Savings Features of Monitor), and Turn off monitor. Your graphics or display card driver may be outdated or incompatible. Virtual Weather Station uses high resolution graphics that all display drivers must support. However, display cards and their associated drivers are notorious for incompatibilities with the Windows Operating System. You can determine your graphics card manufacturer by selecting Right Click on the desktop, then Display Properties, Settings and Advanced Properties. You may be able to download the latest graphics driver from the manufacturer by performing a search on the adapter part number and chip type.
The mouse moves on it's own or does not operate after launching the software.	You have an IRQ conflict between the serial port and the mouse. The solution is to replace your serial mouse with a bus mouse that resides on IRQ-12. This is not a problem with the software but is a hardware conflict associated with your computer. For more on IRQs, see Microsoft's troubleshooting hints.
How do I find the longitude and latitude for my location?	You can contact your local town hall or city administration, but the best source of information is on the Internet. MapBlast at www.mapblast.com provides this information. Enter your address and the longitude and latitude will be displayed in decimal form. Select this link and the information will be converted to the degree format.
The Sunrise and Sunset Times are Incorrect	Verify that the time zone is entered correctly. Verify that the longitude and latitude are entered properly. Make sure you do not have the latitude and longitude switched Verify that the hemisphere settings are correct.

Problem	Solution
	The celestial calculator is a close approximation of the sunrise and sunset in your location and may be inaccurate by several minutes due to equation inaccuracy or your altitude (the equations are based on sea-level). You can account for this inaccuracy by entering a number in the offset (-60 minutes to +60 minutes).
Sunrise and sunset are off by one hour, or did not change with the Daylight Savings Time Change.	This problem may be related to the operating system's daylight savings time clock. The clock may not be available on your system. To account for this problem, enter an offset of +60 minutes or -60 minutes.
The strip charts lose the data when the program is shut down	Strip charts are intended for plotting data "real-time" and the data is not saved permanently to a file. Reference the section on graphs vs. strip charts.
The minimum and maximum daily values are not correct	Virtual Weather Station must be running to record daily highs and lows (data not stored in your weather station's memory).
Rate of changes are not correct	Rate of change is set to zero when Virtual Weather Station is started. Virtual Weather Station calculates the rate of change by calculating the derivative of a parameter, and then filtering it over one hour. Thus, the rate of change equation factors all of the measurements taken in the last hour, and may not exactly match the change in one hour. Determining the actual change in one hour would require every measurement within the hour to be saved, which is not practical, and would require the software to be operational for more than one hour. Instead, Virtual Weather Station uses calculation techniques standard in the engineering community for calculating rate of change. Virtual Weather Station's rain rate may not agree with the rain rate calculated by the weather station because different techniques are used.
How do I display more decimal points for a parameter?	Change the precision from the display's attributes panel. For example, changing the precision to three will add three numbers to the right of the decimal point (1/1000ths).
The jpeg images are distorted	Power save mode must be turned off to prevent distorted images
Weather display image colors are poor quality	Virtual Weather Station prefers to run at High Color or 16 bit. Select **[Start][Settings][Control Panel]** from the **windows** menubar and **select [Display][Settings] and High Color**.
The software is consuming too much CPU resources	Select **[Program Settings][Program Settings]** and set the CPU resources to Low. Select **[Internet][FTP General Settings]** and set the FTP Priority to Below Normal and select the **Max CPU During FTP** to **OFF**. Select [Communication][Communiaction], and set the Communication Rate (sec) to 3.0 seconds or greater.
The graphical images are missing	You may be low on memory. Reduce the number of graphical images displayed.
The computer is low on memory	Reduce the number of displays. Too many displays may result in insufficient memory.
The graphs update slow or the program locks up when displays are updated	Reduce the length of time in your graphs. Select Plot Last x hours. Enter a number less than 240 hours (for example). Plotting 20,000 points on multiple graphs can cause long delays.

Problem	Solution
	cause long delays.
The font size is incorrect after changing the font type	Changing font type can also change the font size due to font size limitations. To restore default fonts, select the Default button from the font settings window and restart the program.
The Moonrise (or Moonset) is showing ---- instead of the time	Approximately once a month, the moon does not rise (or set) on a given day.
There is no data in my graph or distribution chart when the program is started.	The chart will be empty if (1) the database is empty (example, when the program is first started, or (2) Data has not been collected in the plot time frame specified in the attributes window (the program was turned off).
The data in my graph is wrong. How can I fix it?	This problem is generally a result of bad sensor data from your station, but can be repaired in your database. The data shown in graphs is stored in the database. To fix this data, go to **[Settings][Database Settings]** and edit the database.
The data in my NOAA reports is wrong. How can I fix it?	This problem is generally a result of bad sensor data from your station, but can be repaired in your archive memory. The data shown in the NOAA reports is stored in the archive memory. To fix this data, go to **[Settings][Daily Archive]**, **[Settings][Monthly Archive]** or **[Settings][Yearly Archive]** and edit the data.
The data looks overwritten when opened from the file folder in Virtual Weather Station	Virtual Weather Station launches Notepad to view text files. This is a problem with Notepad. Use another text editor such as Microsoft Word or Wordpad to view the data.
The display image colors are poor quality	Virtual Weather Station prefers high resolution or 16-bit color. Some images may result in poor quality at lower resolution settings.
The numerical markers on the ribbon and temperature displays are not evenly spaced	The software attempts to put a numerical marker at even increments, but this is not always possible. To improve your numerical marker increments, select a high and low range value that results in a difference of a multiple of 10. For example, a low of -40 and a high of 60 will provide a difference of 100. This will produce better marker increments then a low of -20 and a high of 100.
The Dew Point of the weather station is reporting "LL" or limited to 32°F (0°C) and Virtual Weather Station is reporting a value	The Oregon Scientific unit does not report dew points below 32°F (0°C) but Virtual Weather Station continues to report these values.
The sea-level barometer does not report what is entered in the Station Settings window.	Virtual Weather Station only reports the sea-level barometer from your station. Reference Section 6.7.6 for more details.
The software is reporting a cloud base when there are no clouds in sight.	This is only an estimate based on relative humidity and temperature. Other weather parameters affect the cloud base, and should only be used as an estimate.
A Virtual Weather Station parameter displays a different number than the station console	Make sure that you have not entered a calibration (reference Chapter 6.3). Changing the calibration of a sensor will not change the value on the display.

Problem	Solution
The Daily Rain is not correct	The program must be running at midnight for today's daily rainfall to be correct. The Weather Station does not store daily rainfall.
The monthly rainfall reported in the NOAA report does not agree with the sum of the daily rainfall.	This is due to the station total rainfall reset by the user, or the values for minimum or maximum rain edited by the user. Reference 6.19.2 for more details to correct this.
How do I change my NOAA report data?	This is done in the Archive Settings window, and not the database. Reference Section 7.2 for more details.
When I update one of the fields in the daily summary data, this change is not updated in the monthly or yearly summary data.	You must edit each of these data fields. For example, if the minimum temperature on January 9, 2000 is changed, and it is the minimum for the month and year, you must change this field in the monthly summary panel and the yearly summary panel.
The Alarm Sound will not play	This feature requires a sound card. This is not a problem with VWS, but with your sound card. Contact your sound card manufacturer
Some of the check boxes on the Parameters Display Panel are dimmed	Not all parameters can be displayed with all of the weather elements. For example, graphs require historical data, and it does not make sense to plot sunrise.
The displays do not retain their position when exiting the program.	Make sure you have enough memory in your computer to save the displays. The display positions are saved in the file **VWS\setup\position.bin**. If this file is corrupted, close VWS, delete this file and restart Virtual Weather Station. You will need to reset the displays again. Try a different drive. The drive you installed Virtual Weather Station on may be read only.
After hiding Virtual Weather Station with the taskbar icon, and recalling the display by double clicking on the taskbar, the window does not refresh	This is a Windows problem. Minimize and maximize the application again to refresh.
One of the sensors is not updating, and VWS will not begin executing (WMR-918 or WMR-968 only).	Virtual Weather Station requires all of your sensors to operate to properly obtain data. If one sensor is not functioning due to batteries or interference, deselect this sensor. *See Section 6.5.6, Sensor and Battery Status (WMR-918 and* WMR-968 only) for more details.
My system clock is losing time when I run Virtual Weather Station.	Use the Synchronization feature in Virtual Weather Station. Select Settings | Synchronize Date and Time from the menubar. Note - you must be the administrator on an NT machine for this to work. You may have a bad ROM BIOS chip. You may need a new battery on the motherboard. Power management software in Windows can cause clock time loss. It may be a Windows 95 and 98 problem. Windows NT handles this better because of the operating system design. When you connect your weather station to the communication port, Windows must process interrupts to read this data. With weather stations, this occurs every 3 seconds. This causes the clock to slow down.

Problem	Solution
	If your computer is running other utilities, the clock speed may be affected even more. *Your computer may need a tune-up*. Here are some useful hints: 1) Don't run continuous virus checking. Have virus scanner scan your files on a batch basis. Continuous virus checking slows down your computer. 2) We have had excellent luck with two parts of Norton Utilities: (a) Norton Optimization Wizard (gets your swap file to the right size) (b) WinDoctor. Run both monthly and let them tune your computer. 3) If you have a number of programs running in the taskbar or resident to your system, delete them. When you close all your programs you should only see about 6-7 programs in your task list. 4) Get enough memory (>64Mb). 5) Run as few real mode drivers as possible (take everything out of your autoexec and config.sys). 6) Its fun to load a lot of programs to try them out, but every one of them leaves traces behind in the form of .vxd's, .dll's, and registry entries that will eventually slow up your system beyond repair. In the meantime, they slow it down and cause odd functionality. 7) If all else fails, reinstall Win98. Don't just reinstall over your existing windows directory, either. Wipe out c:\windows and c:\program files and start again. You may have to spend 4 hours reinstalling your apps, but your computer will run faster, you will use less disk space, and it will be more reliable. Download a Clock Synchronization program, which synchronizes with the atomic national clock. One example is www.beaglesoft.com
The language does not change when changed from English	Virtual Weather Station provides limited foreign language support. To change the titles to the language of choice, edit each individual display.
What are channels 1, 2 and 3?	Channels 1, 2 and 3 are designated channels for the optional sensors.
I receive Invalid Page Faults and General Protection Faults in Kernel32.DLL	Invalid Page Faults and General Protection Faults in Kernel32.DLL are generally caused by a lack of system resources, out of date video drivers, or a corrupt swap/paging file. If you encounter the problem on a regular basis, the following instructions should help resolve the problem: **Windows 95 users ONLY**. (Windows 98 users proceed to step 2.) If the kernel32.dll error occurs while you are browsing and you are using Windows 95, this problem could be occurring due to Windows 95 bug. The bug is present in earlier versions of Windows 95 and Microsoft has posted an update which resolves the problem. In order to determine which updates you need, **right**-click on the My Computer icon on your desktop and select Properties from the menu. Click on the General tab to make sure it is in front. If you have the version of Windows 95 on the left, you should follow the instructions on the right:

Problem	Solution
	4.00.950 Install Service Pack 1 first, then install the Kernel 32 Update. 4.00.950a Install the Kernel 32 Update. 4.00.950B Service Pack 1 and Kernel Update not needed. 4.00.950C Service Pack 1 and Kernel Update not needed. **NOTE:** The kernel update should only be applied if you have already installed Service Pack 1 for Windows 95. If you have Windows 95 version 4.00.950 (with no letters after the number), you should first visit the following page for information on downloading and installing Service Pack 1: Windows 95 Service Pack 1 If you have Service Pack 1 installed, you will have Windows 95 version 4.00.950a. In that case, you should install only the Kernel 32 Update. The kernel update can be found here: Windows 95 Kernel 32 Update **Important:** The location of Microsoft's updates may change. If the links in this article do not bring you to the Microsoft update pages, use the search page on Microsoft's site in order to download the Service Pack and Kernel updates. If you have any questions regarding the Service Pack or Updates, please contact Microsoft for assistance. Finally, make sure that Windows is configured to handle virtual memory (unless you are an advanced users who has configured a static swap file). Click the Start button and select Settings, then Control Panel. In the Control Panel window, double-click the System icon. Click the Performance tab and then click the Virtual Memory button. Click "Let Windows manage my virtual memory settings (recommended)". Click OK as prompted until you return to the Control Panel window.
I am experiencing a memory leak.	Memory leaks are common with the Microsoft Operating System if functions are repeated over and over again (for example, When you run a program that uses Windows Sockets in Windows 95, a gradual increase in the memory used by the operating system may occur over time, especially if the program opens and closes a large number of sockets). It is a good practice to download the latest operating system version and patches from the www.microsoft.com website. In addition, the following link provides insight to operating system memory leaks: Microsoft Operating System Memory Leaks

Problem	Solution
System Socket Web Server Error	Check to make sure you are connected to the Internet, or you are not conflicting with another Web Server running on your PC. Quit the Virtual Weather Station program and manually connect to the World Wide Web. Relaunch Virtual Weather Station.
My modem connection will not hang up.	• Another application is dialing and taking over the modem when VWS dials. These "subversive" applications wait until you establish a connection to the Internet, and then download or upload data. Close all applications except VWS to see if this is the problem. Select Ctrl-Alt-Delete once to identify hidden applications • If you selected "Use Default Internet Connection" under Network Settings, The status = InternetAutodialHangup(0); function does not work, and will not hang the phone. Check out Microsoft's http://support.microsoft.com/support/kb/articles/Q235/6/66.ASP link for more information. • Low quality modems do not always respond properly to the Hang Command from the operating system.
I commonly receive timeouts during FTP	• Increase the CPU usage during FTP operation by selecting Internet | FTP General Settings | Max CPU During FTP
Why does "WINOLDAP" run multiple times and not shutdown?	• Virtual Weather Station accesses some applications through the command line. This is because WINOLDAP is not being automatically closed when it finishes. In order to remedy this you need to modify the DOS box properties for CONAGENT.EXE, CONAGENT.PIF, or _DEFAULT.PIF (probably in \windows). 1. Start Explorer. 2. Locate one of the above files in the \windows\system directory. 3. When over the file click the right mouse button. 4. Choose 'Properties' from the speed menu. 5. Choose the 'Program' tab. 6. Turn on the 'Close on exit' option.
My wind run values are out of range	There may be wind run calculation problems with specific computers due to the microprocessor and other hardware devices. If you find the wind run values are out of range, place the following line in your win.ini file: wuseDefaultTimer=True To reset these values, select Settings | Recall Daily, Monthly and Yearly and edit the windrun for the day, month and year.
The Sea-level and measured barometer readings are the same.	Some stations only report the sea-level barometric pressure after adjusted from the console. To back-out this correction, set a negative bias in the calibration panel. For more information on calibration, see section 6.3.

Table 18 - Troubleshooting Tips

10.1 Advanced Communication Troubleshooting Tips for Oregon Scientific Weather Stations

If you followed the troubleshooting tips above and could not find a solution, you likely have a problem with your station's communication port, the cable or your computer.

To verify that you are receiving data, launch Hyper Terminal, which is a terminal emulation program distributed with most Windows operating systems.

- ✓ Launch Hyper Terminal, Select **[Start][Programs][Accessories][Hyper Terminal]** from your Windows Desktop.
- ✓ Run Hyper Terminal by selecting the **Hypertrm** icon.
- ✓ Enter a **Name** (any name is OK) for the connection description.
- ✓ Select **Connect Using** and **Direct to Com x**, where x is the comport designation.
- ✓ Select 9600 baud, 8 data bits, Parity None, 1 stop bit, Flow Control Hardware Control.
- ✓ You should see binary data on the display every time your station sends data (example, **!¤ P 3 3 ¼ Pyü**).
- ✓ If you see data streaming on the display, contact Ambient, LLC (support@AmbientWeather.com).
- ✓ If you do **not** see data streaming on the display, please contact Oregon Scientific, your PC Manufacturer, or the cable manufacturer.

11 Glossary of Terms

The following is a glossary of weather and instrument terms.

Term	Definition
AIR DENSITY	The ratio of the mass of a substance to the volume it occupies. In oceanography, it is equivalent to specific gravity and represents the ratio of the weight of a given volume of sea water to that of an equal volume of distilled water at 4.0 degrees Celsius or 39.2 degrees Fahrenheit.
ATMOSPHERIC PRESSURE	See barometric pressure
BAROMETRIC PRESSURE	The pressure exerted by the atmosphere as a consequence of gravitational attraction exerted upon the "column" of air lying directly above the point in question. The measurement can be expressed in several ways. One is in millibars. Another is in inches or millimeters of mercury (Hg). Also known as atmospheric pressure.
BEAUFORT WIND SCALE	A system of estimating and reporting wind speeds. It is based on the Beaufort Force or Number, which is composed of the wind speed, a descriptive term, and the visible effects upon land objects and/or sea surfaces. The scale was devised by Sir Francis Beaufort (1777-1857), hydrographer to the British Royal Navy.
CALIBRATION ERROR	The inaccuracy that the manufacturer permits when the unit is calibrated in the factory.
CLOUD BASE	For a given cloud or cloud layer. The lowest level in the atmosphere at which the air contains a perceptible quantity of cloud particles. Virtual Weather Station estimates the cloud base on temperature and humidity readings, using the following equation: Cloud Base (ft) = 250(Temperature - Dew Point)
COOLING DEGREE DAY	A cooling degree day is given for each degree that the daily mean temperature departs above the baseline of 75 degrees a given temperature It is used to estimate the energy requirements, and is an indication of fuel consumption for air conditioning or refrigeration. Refer to degree day or heating degree day.
DEW POINT	The temperature to which a sample of air must be cooled, while the mixing ratio and barometric pressure remain constant, in order to attain saturation by water vapor. When this temperature is below O°C, it is sometimes called the frost point.

Term	Definition
GUST	A sudden significant increase in or rapid fluctuations of wind speed. Peak wind must reach at least 16 knots (18 miles per hour) and the variation between peaks and lulls is at least 10 knots (11.5 miles per hour). The duration is usually less twenty seconds.
HEAT INDEX	The combination of air temperature and humidity that gives a description of how the temperature feels. This is not the actual air temperature.
HEATING DEGREE DAY	One heating degree day is given for each degree that the daily mean temperature is below 65 degrees a given temperature. It is used as an indication of fuel consumption. Refer to degree day or cooling degree day.
HUMIDITY	The amount of water vapor in the air. It is often confused with relative humidity or dew point. Types of humidity include absolute humidity, relative humidity, and specific humidity.
LATITUDE	The location north or south in reference to the equator, which is designated at zero (0) degrees. Parallel lines that circle the globe both north and south of the equator. The poles are at 90 degrees North and South latitude.
LONGITUDE	The location east or west in reference to the Prime Meridian, which is designated as zero (0) degrees longitude. The distance between lines of longitude are greater at the equator and smaller at the higher latitudes, intersecting at the earth's North and South Poles. Time zones are correlated to longitude. See Greenwich Mean Time.
MOON PHASE	The moon phase is caused by sun rays reflecting off the moon's surface while it moves around the earth. The sun illuminates half of the moon at any time while the moon orbits around the earth. The variation in the angle made by the earth-moon line with respect to the earth-sun line causes changing phase of the moon. The moon completes one revolution around the earth in 27.322 days with respect to the background stars. This is called the SIDERIAL period of the moon. During this same time the earth moves about 27 degrees along its orbit around the sun. As a result, the moon takes about two extra days to complete the cycle with respect to the sun-earth line. This longer cycle of the moon that takes about 29.57 days is called SYNDONIC period of the moon. The longer cycle is considered as Lunar month.
PRESSURE ALTITUDE	Atmospheric or barometric pressure expressed in terms of altitude which corresponds to that pressure in the standard atmosphere.
RATE OF CHANGE	The derivative or change in a parameters value with respect to time. Virtual Weather Station calculates the rate of change by calculating the derivative of a parameter, and then filtering it over one hour. Thus, the rate of change equation factors all of the measurements taken in the last hour, and may not exactly match the change in one hour.
RELATIVE HUMIDITY	A type of humidity that considers the ratio of the actual vapor pressure of the air to the saturation vapor pressure. It is usually expressed in percentage.
SEA LEVEL PRESSURE	The atmospheric pressure at mean sea level either directly measured by stations at sea level or empirically determined from the station pressure and temperature by stations not at sea level. Used as a common reference for analyses of surface pressure patterns.
SUNRISE	The daily appearance of the sun on the eastern horizon as a result of the earth's rotation. In the United States, it is considered as that instant when the upper edge of the sun appears on the sea level horizon. In Great Britain, the center of the sun's disk is used instead. Time of sunrise is calculated for mean sea level. See sunset for comparison.
SUNSET	The daily disappearance of the sun below the western horizon as a result of the earth's rotation. In the United States, it is considered as that instant when the upper edge of the

Term	Definition
	sun just disappears below the sea level horizon. In Great Britain, the center of the sun's disk is used instead. Time of sunset is calculated for mean sea level. See sunrise for comparison.
VAPOR PRESSURE	The pressure exerted by water vapor molecules in a given volume of air
VIRTUAL TEMPERATURE	Virtual temperature is a fictitious temperature that takes into account moisture in the air. The formal definition of virtual temperature is the temperature that dry air would have if its pressure and specific volume were equal to those of a given sample of moist air. Virtual temperature allows meteorologists to use the equation of state for dry air even though moisture is present.
WIND CHILL INDEX	The calculation of temperature that takes into consideration the effects of wind and temperature on the human body. Describes the average loss of body heat and how the temperature feels. This is not the actual air temperature.
WIND DIRECTION	The direction from which the wind is blowing. For example, an easterly wind is blowing from the east, not toward the east. It is reported with reference to true north, or 360 degrees on the compass, and expressed to the nearest 10 degrees, or to one of the 16 points of the compass (N, NE, etc.).
WIND RUN	The distance or length of flow of the air past a point during a given interval of time.
WIND SPEED	The rate of the motion of the air on a unit of time. It can be measured in a number of ways. In observing, it is measured in knots, or nautical miles per hour. The unit most often used in the United States is miles per hour.

Table 19 - Glossary of Terms

11.1 Beaufort Scale

The Beaufort scale is a system of recording wind velocity (speed) devised in 1806 by Francis Beaufort (1774–1857). It is a numerical scale ranging from 0 for calm to 12 for a hurricane.

Number and description	Features	Air speed	
		kph	mph
0 calm	smoke rises vertically; water smooth	0–2	0–1
1 light air	smoke shows wind direction; water ruffled	2–5	1–3
2 light breeze	leaves rustle; wind felt on face	6–11	4–7
3 gentle breeze	loose paper blows around	12–19	8–12
4 moderate breeze	branches sway	20–29	13–18
5 fresh breeze	small trees sway, leaves blown off	30–39	19–24
6 strong breeze	whistling in telephone wires; sea spray from waves	40–50	25–31
7 near gale	large trees sway	51–61	32–38
8 gale	twigs break from trees	62–74	39–46

Number and description	Features	Air speed	
		kph	mph
9 strong gale	branches break from trees	75–87	47–54
10 storm	trees uprooted; weak buildings collapse	88–101	55–63
11 violent storm	widespread damage	102–117	64–73
12 hurricane	widespread structural damage	above 118	above 74

Table 20 - Beaufort Scale

11.2 Heat Stress Index

The Heat Stress Index calculates the body's reaction to heat and humidity, or the Heat Index. High temperatures and humidity stress the body's ability to cool itself, and heat illness becomes a special concern during hot weather.

Do not base important decisions on this heat stress index! Everybody's reaction to heat is different.

Scale	Condition
---	Heat Index < 80 °F
Caution	80 °F < Heat Index < 90 °F
Extreme Caution	90 °F < Heat Index < 105 °F
Danger	105 °F < Heat Index > 130 °F
Extreme Danger	Heat Index > 130 °F

Table 21 - Heat Stress Index

11.3 Comfort Index

The comfort index calculates the body's reaction to heat, cold, humidity and wind chill. High temperatures and humidity stress the body's ability to cool itself, and low temperature can stress the body's ability to heat itself.

Do not base important decisions on this comfort index! Everybody's reaction to heat and cold is different.

Scale	Condition
Extreme Cold	Wind chill < 0 °F
Uncomfortably Cold	0 °F < Wind chill < 30 °F
Cool	30 °F < Wind Chill < 60 °F
Comfortable	60 °F < Temperature < 80 °F
Warm	80 °F < Temperature < 90 °F
Uncomfortably Hot	Temperature > 90 °F and Heat Index < 100 °F
Extreme Hot	Heat Index > 100 °F

Table 22 - Comfort Index